



CHEETAL

JOURNAL OF

The Wild Life Preservation Society of India

Vol. 15

No. 4

Chital brocket rolling eyes (observe attitude and rolling eye of the animal to the left.)

—Photo by M. Krishnan.



Wild Life Preservation Society of India

1. The aims and objects of the Society are as follows:—

- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wild life, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wild life.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wild life and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wild life administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wild life in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wild life stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wild life.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wild life and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wild life in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wild life in India.
- (i) To conduct research into the problem of Wild Life management in India, and in pursuance of this, to initiate, encourage and, where possible assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work.
- (j) To carry on such other activities which will serve the above subjects.

What membership of Wild Life Preservation Society of India will entitle you to ?

1. You will become an active member of the growing group of Wild Life enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wild Life for posterity.
2. You will be entitled to the full use of the Library of the Wild Life Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concessional rate.
6. You will be entitled to buy at concessional rates the Society's Greeting Cards, Calendars, Tie, Lapel badge and the Balance of Nature Game (specially Published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", the quarterly journal of the Society free.

For membership particulars write to Honorary Secretary, Wild Life Preservation Society of India, 7 Astley Hall, Dehra Dun.

CONTENTS

	PAGE
1. Mistakes in Conservation Part I by Saroj Raj Choudhury ...	3
2. Communication Among Higher Animals by M. Krishnan ...	11
3. Reptile Fauna of Dehra Dun District (Uttar Pradesh) Part-I by R.K. Bhatnagar ...	15
4. A Marine National Park by A.G. Raddi ...	24
5. The Grey Goats of the Blue Mountains by Priyadarshini Davidar ...	28
6. Musk As An Important Commercial Wild Life Product by R.K. Bhanotar and R.K. Bhatnagar ...	31
7. On Additions To the Fish Fauna Of North Bengal by Raj Tilak, Zoological Survey of India, Calcutta ...	34
8. A Dwindling Population of Swamp Deer, <i>Cervus duvauceli branderi</i> Pocock (Family: Cervidae: Mammalia) by N.K. Sinha, Zoological Survey of India, 27 Chowringhee Road, Calcutta-13 ...	41
9. Further Notes on Opening of Eyes of Some Wild Carnivores in Captivity by L.N. Acharjyo and R. Misra ...	49
10. The Spotted Terror by Lt. Col. A.A. David ...	56
11. आकर्षक एवं सुन्दर राष्ट्रीय पक्षी मोर—वीरेन्द्र सहाय सक्सेना, भारतीय वन सेवा, उप वन संरक्षक, जयपुर ...	६३





OUR HERITAGE...

the tiger by the water hole; the elephant in the forest; bison crossing a road; lions in the Gir forest; rhinos in Assam. What more valuable heritage can we have? This heritage of ours is priceless. But is being steadily destroyed. Protect our heritage...our wild life.



TATA ENGINEERING AND LOCOMOTIVE COMPANY LIMITED
148, Mahatma Gandhi Road, Bombay-1.

Mistakes in Conservation

PART I

By

SAROJ RAJ CHOUDHURY

Where do we stand to-day with conservation, wildlife in particular ?..... Let me draw comparison from North America. They have travelled far through the various stages in progressive conservation; we are preparing to make a start.

The comparison is authenticated by quoting from the book 'Game Management' by Aldo Leopold.*

" ... better law enforcement and prohibition of meat hunting. The game literature of the closing century is saturated with these two ideas. They became personal dogma and public law. 'Game protection' became a 'cause'. The game hog and the market hunter were duly pilloried in the press and the banquet hall, and to some extent in the field and wood, but game continued to wane.**

"Came then Theodore Roosevelt with the idea of 'conservation through wise use'. Wild life, forests, ranges and water power were considered by him to be renewable organic resources, which might last forever if they were harvested scientifically, and not faster than they reproduced.***

"The Roosevelt doctrine of conservation determined the subsequent history of American game management in three basic respects:

* Professor Leopold is considered the father of scientific wildlife conservation in the States. The word 'game' used by him applied generally to all kinds of wild animals and their habitats, many of the game species being the 'indicator species' for a wide range of associated communities. Conservation—not preservation—management of the large cats and their prey animals, i.e., the other ground and arboreal game animals, automatically provides the optimal living conditions for all other non-game species in the related ecosystems.

** How true is the same to-day in our country !

*** The Ruling Principles of biotic properties and function, true in any land in any age.

1. It recognised all these 'outdoor' resources as an integral whole.
2. It recognised their 'conservation through wise use' as a public responsibility, and their private ownership as a public trust.
3. It recognised science as a tool for discharging that responsibility.

* * * * *

With the Rooseveltian era, however, came the Crusader for conservation, a new kind of naturalist who refused to stomach this anomaly. He insisted that our conquest of nature carried with it a moral responsibility for the perpetuation of the threatened forms of wild life. This avowal was a forward step of inestimable importance. In fact, to any one for whom wild things are something more than a pleasant diversion, it constitutes one of the milestones in moral evolution.

Game management is merely an attempt to deal with the corollary question: How shall we conserve wild life without evicting ourselves ?

The Crusaders wrote many volumes, but those told us why rather than how wild life and civilization should be adjusted to each other. These men were mostly biologists, but strangely enough their technique was not biological. It was, rather, an intensification of the pre-existing idea of protective legislation, which experience has now shown does not alone suffice, even when enforced. *It retards, but does not reverse the forces of destruction.*

* * * * *

Both scientists and sportsmen now see that effective conservation required, in addition to public sentiment and laws, a deliberate and purposeful manipulation of the environment the same kind of manipulation as is employed in forestry.

* * * * *

"The hope of the future lies not in curbing the influence of human occupancy—it is already too late for that—but in creating better understanding of the extent of that influence and a new ethic for its governance"

Aldo Leopold published his book just 40 years back. A little over half as many years prior to that, approach to wildlife problems in the States was what it is to-day with us, the old fashioned preservation concept.

Experience has confirmed convincingly that preservation is a natural consequence of wise use of resources. And wise use is the practice based on biological and social factors and influences carefully evaluated and their projections subjected to deliberate and pur-

poseful manipulation or governance with a view to perpetuate these natural resources at their highest quality and productivity.

The point is, should we start it all over, inevitably with many pitfalls, to build up our own reference sheet, or should we make intelligent use of documented experiences—reliably measured, compared and screened during the past half a century—and take long strides to catch up with their progress?

The choice lies, undoubtedly, on the latter course, in that, we first learn to avoid repetition of mistakes. It is the most important step in wildlife conservation, indeed, the very basic of environmental conservation. When we avoid mistakes, we are at least sure among other things that human intelligence, in its predictably perverse pursuits, is not provided with any known scope for misuse, or in its reflux focus does not digress into unwilling errors.

The question that crops up naturally is: What are those mistakes and how do we grade them?

The biggest of all mistakes is for the land manager to continue to remain ignorant. And the worst of all follies is not to admit it.

There are varying degrees of many other forms of intellectual and functional mistakes depending on regional and local factors and the levels of awareness. In these, there are quite a few which are apparent to the observant eye in the field, often voiced by the discerning local man.

To illustrate my point, let me cite a few random examples from my experience.

OVER EXPLOITATION

Poaching with crop protection guns:

December 13, 1961: an interior Kondh village Mundra in South Orissa. By 9 A.M. more than 400 Kondh and other tribal villagers from many hill villages gathered there. They had come to beat the notorious Ausurgarh (alias Asurpara) man-eater out from its suspected hideout in the ravines nearby. I found in that melee, nearly 50 country made match-lock guns and two sophisticated 12 bore breech-loaders. The latter were said to be gifts for crop protection. Jokingly—using their usual vocabulary of intimacy—I asked the owners if they knew which end of the barrel fired. Back came the sharp, indignant retort: They had shot in two years, more than 50 big animals, each.

April 3, 1969: I was staying the night over at Jenabil, for the conducted tour of a group of press representatives, in the Similipal hills in North Orissa. At 10 P.M. in moonlight came the elephants to the summer paddy fields near the Rest House. Soon we

heard the whizz of stones flying from the machans of the tribal land owners guarding their fields. They were using the simple string slings. And, what a pandemonium of stampede and trumpeting ensued when the stones hit the elephants! The watchers lost no time in putting speed into the legs of those retreating goliaths by firing a few loud bangs from what they call the 'Gandhi-gun', made with a female key secured to the end of a stout stick, a wire-nail and a pinch of sulphur-nitre mix for detonation.....Silence settled in the valley for the rest of the night.

The mistake is apparent I hope by comparison of the two methods.

The crop protection measure should use deterrents not decimators. The deterrents are tried out and selected through the media of sound, sight, smell, even minor injuries and also fencing, if economic. It should not involve random killing and crippling in and outside the crop fields.

In two years, more than 100 big animals were killed by two breech-loaders. Except perhaps the gunners, nobody knew how many were crippled; a disabled animal is exposed to speedy despatch by the natural forces in the forest. Those killed or crippled were all public property. The number of animals killed by the muzzle-loaders is anybody's guess. The value of those killed by the breech-loaders alone was over Rs. 20,000/-. All those could have been taken in a staggered manner, discreet and methodised, with an eye to the breeding stock, the productivity and the accounting of the value to public benefit, not private gain. The local villagers themselves could have been given the major share for cooperation as in many other countries. And when such harvests are taken in an organised way, the venue of annual take can be located near the crop field itself to achieve the dual purpose of harvesting the animals and protecting the crop fields.

* * * * *

Poaching with trained dogs

November 11 to 15, 1968: I was camping at Deogarh (Orissa) to assess the nature and extent of crop depredation by elephant and discuss with the old timers there—the shikaris and the mahuts—the economics of Bamra Raj methods of capturing wild elephants. Our talks often rambled on to linger over the reminiscence of those lost days of excitement-packed rich sports with the Bamra forests' game animals which in more recent years showed sharp decline due to rampant poaching.

"How can we stop this rampage? I once put to the veteran shikari this question which was always uppermost in my mind as the state wildlife conservation officer.

"Stop it?" He exclaimed, "It is getting worse now." And in trying to prove his point he asked me, "Can you imagine the efficiency of the hill men with their bows and arrows?"

"Yes, I know." I said, "I have known his kind for over three decades, from my early shikar days. I know his fabulous remote sensing faculties in following the spoor, his indefatigable persistence and his feline like endurance with equally matching muscular coordination in tracking and stalking."

"Yes," we took up the link nodding his head, "And now you think of that man going out with a sophisticated gun, quick loading, long range and unfailing in his hand: what chance for escape for the animals? That is not all Choudhury babu; he is now helped by trained dogs! In close confiding groups, a well trained dog can be hired for two hundred rupees a day; it is that sure of success and profits. And when there is no such gun-man, two or three of these dogs are taken into the forests where they are let loose in sambar habitats. When these dogs locate a sambar, they behave just like stalking wild dogs to scare and force the sambar right down to the village tank near the forest. The dogs are trained that way. Last month two sambars were killed thus by the villagers in a tank." A pause, a deep heave of sigh—and then, he put my thoughts into words, "Honestly, I do not know how we can stop this madness."

That question remained unanswered. Perhaps it still remains so to-day, and on its solution alone may depend the future prospect of wildlife in many similar regions in this country.

* * * * *

Poaching with pesticides

April 1, 1968: I was rushing 490 kilometres to a Kondh Village 'Karlangi' in South Orissa to investigate into a case of man-eating and decide whether the tiger should be declared a man-eater. At 9 A.M. we parked the jeep near a wayside tea-stall at Saranakul. The jeep, the rifle and our field dress attracted a crowd. They enquired and learnt the purpose of our journey... Came then an old man, examined my rifle and looked into my eyes: "Why worry about tigers and panthers?" he said, "They will soon be finished by the method brought to us by the 'sarkar'. Only recently two panthers and a number of bears were killed by insecticide which has been given to the Blocks.

"Are not the insecticides doing much good to your crop?" I asked.

"Will you allow your children to play with fire?" he shot back to shut my mouth.

I was reminded of the many instances—elephants to pigeons—I have seen and reliably heard of the ignorant and ill-advised people playing with this fire to seriously upset the normal biological structure and functions in quite a few of the top wildlife areas in my state.

Could it not be stopped? Of all the various methods of killing wild animals, the use of poison is the worst, because it works surreptitiously without giving any chance to the

residual population to associate danger to such killers which they cannot detect by their sense organs. Could not some smell and taste repellents—urea and cinchona perhaps—be compulsorily mixed with the insecticides to make them repel the animals? And why can't the insecticides be dispensed under responsible supervision? Even if such a process is subsidised, the investment would be amply repayed by curbing the crippling over-exploitation of the renewable resource, the gradual eating into the capital and the total annihilation at the end.

* * * * *

Poaching by the sophisticated and other arm chair gunners

My first visit after ten years in 1967, to the beautiful Similipal hills. I was now my State's Wildlife Conservation Officer. Back in the mid-fifties I had, for over three years, known intimately this vast complex of uncomparable wildlife region in the country spreading well over 2500 square kilometres of rolling table land. I met many of my acquaintances. We talked of old times and my present assignment. I placed before them the problem of wildlife conservation in those hills. The reply everywhere was in the same tone, "Stop that man who comes in the jeep with those blazing search lights. You will solve much of your problem."

The old head-man of Nawana was more candid. "See, you can any time control us", he said, "what have we got except the bows and the arrows"?

"Yes, but I have seen here gaurs being killed with arrows." I interposed.

"True", he said, "but that takes joint effort from very close range, a volley of arrows, not just one. The man who comes with the jeep and the search light, he is the worst offender. It is now a competition between him and us. Who cares for animal conservation? What good is it to us? On the contrary there will be more problems for our crop fields."

I knew he was projecting his past experience with wildlife during the feudalistic rule. He had taken all the brunt of the depredation of his crop fields. He never got the benefit from the animal productivity. Naturally he thought that the juicy stuff that had gone to the sophisticated dining table had been fattened at his expense. And so, he is losing no time now in taking it out with the wild animals while the going is good in competition with the outside poachers. Over two decades of such a deal to the wildlife not only seriously diminished their population, it tilted addition, the human actions, and made them more self-centred to the gradual exclusion of the immediate and long term interests of the community.

* * * * *

Poaching by traps etc.

January 7, 1971, the second batch of wildlife education trainees were belt—sampling field evidence along the Sivdhari sot (dry nala) in Chilla forests, opposite Hardwar. Two patches of fresh blood with some big cat's hairs was located by Nihar near a footpath on the left bank of the sot. Systematic tracking got us to the steel trap (reset on an interior footpath), hence to the panther skeleton, the fresh skins of spotted deer and barking deer and finally to the hastily deserted camp of the poachers where we found the bits of raw deer skin, antlers in velvet and corner pieces from the trimmed edge of the panther skin.

One finds to-day some of the refilled trap-pits on the remote game trails in this range. The local villagers are afraid of the rowdy smugglers indulging in this trade. Effective communication between the administration and the people is lacking. The people divulge the secret only when their confidence is weaned by repeated contacts.

Results, response and remedy of over exploitation

These are various methods of poaching, with or without alibi, which have and are making unaccounted for inroads into our renewable animal resources by removing them faster than they reproduce. No one can take stock of such a process because, barring a few cases of detection, no one has attempted to know about the bulk of such removals—how where and when.

More than any legal deficiency—for which positive steps have now been taken by the Centre and many of the states—the main root of such a destructive process lies in the growing deficiency in the social outlook, a serious circumstantial lack of appreciation of the sustained value of conservation.

There is no instant remedy for such a change in the mode of human behaviour, the competition for immediate gains of individuals or groups to the blurring of the future view on the consequences. It is all the more serious because the community at large seems resigned to what may happen—rather will happen—which is indicated in the comparison of our present happenings with the past experience of others in similar conditions.

Cooperation of the local man is essential

In the vast spreadout of these resources, whose sustained renewability is far more important and valuable than any finite and exhaustible deposits of minerals and potential energy (organic fuel) concentrates, the scope for misappropriation is open at every fold of the land surface, every turn of the periphery, indeed behind every other bush and tree! This is fact. Anyone who has moved with zest to prevent illegal acts in the forest, knows this. Sentinels cannot be put at each vulnerable point.

In any attempt to conserve these resources, therefore, it is essential to enlist the cooperation of the local man. He should realise its importance and take active part in the conservation and improvement of the productive base, so that he may realise his wghted

share, with the community and the state, of the benefits from its productivity. Evidently his interest has to be stimulated in a convincing way. He has to be educated in conservation. We have to reach the people at their level to revive their consciousness. But we must first be clear on what we want to educate them about, for the rural man can easily see through a pretender. Traditionally and inherently his philosophy does not permit him to be rude on our face, but still, he knows, for he is an intelligent human being.

The point is, when are we going to prepare ourselves to reach the people? When do we start looking into it in right earnest? We have already lost a quarter of a century!

(To be continued)

While emigrating from England to Australia in 1969, a woman smuggled her pet budgerigar on to the plane. En route, however, the bird spoke out and was discovered. Since the importation of budgerigar is banned in Australia—though that is where they originated—Bonnie had to be left behind in Hong Kong while she flew on to Sydney.

In Sydney, she made tearfull entreaties for Bonnie. But the customs officials were adamant; Bonnie was *avis non grata*. What to do? She did what any other budgerigar fancier would have done: she returned to Hong Kong and took Bonnie back to U.K., some Rs. 11,400 poorer.



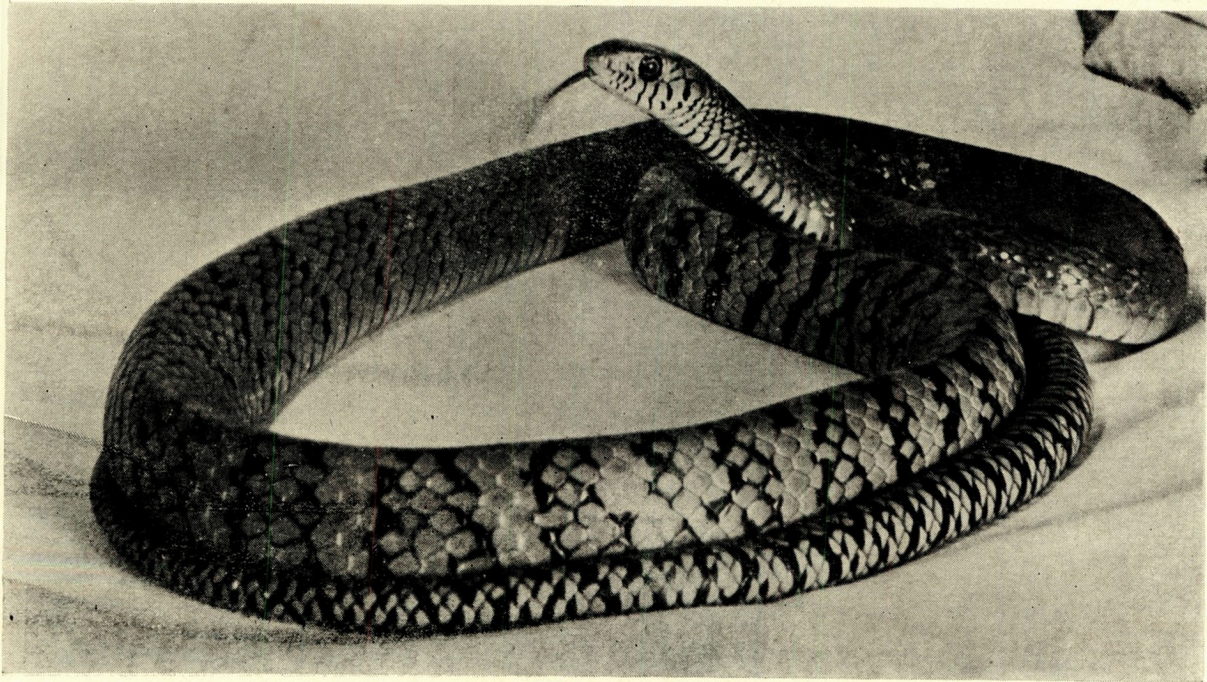
The tracks of the poacher's
Jeep.

Evidence of the weapon used.



Chital hind carcass found
in a nala. The poacher
took out the heart, lungs,
liver and kidneys only.

The Rat-Snake



Rat snake (*Ptyas mucosus*)

Inconspicuous Hero of the Green Revolution

A snake moving like an express train through thick grass or paddy stubble, large and darks glistening in the sun as it zips along. Suddenly it stops and rears its head straight up to see over the grass with large yellow and black eyes. Its long jet-black tongue flicks through the air, tasting and smelling for enemies or prey. Then it drops down and proceeds more slowly along a well-worn rodent trail that ends leading into a burrow. Entering cautiously the snake penetrates the darkness deep below the hot surface. The smell of rats is fresh and strong and the six foot snake has just shed its skin and is ravenous. Within a few minutes the rat-snake has swallowed two adult and four half-grown mole rats and silently accomplished what a human rat-control agency struggles to do to justify its existence.

The odd thing is though, after saving some farmers a lot of grain and damage by killing off a band of rats, this beautiful snake is likely to be stoned to death should it foolishly expose itself.

It will probably be a long while before everyone sees snakes the way we do. However we see optimistic signs and in some parts of India where the rat-snake or dhaman or sarai pambu is protected by knowledgeable farming people. Right now, and for the past fifty years a big problem affecting the rat-snake (and therefore agriculture) has been the snake skin industry. With the recent welcome ban on the export of venomous snake skins there will naturally be heavy pressure on the harmless species, especially the rat-snake and another prodigious rodent-eater, the sand boa, coming next. After all, when we have the most efficient rat-catchers of all ready and willing to help us and we are killing them off at the rate of thousands per day for their skins it seems a bit crazy to complain that we are losing 20% to 50% of our grain to rats, doesn't it?

R. Whitaker
Madras Snake Park,
August, 1973.

Communication Among Higher Animals

(Second instalment in series)

M. KRISHNAN

II Visual Communications

Visual efficiency varies considerably among the mammals. Most of them, as said already, do not have our colour-sensitive eyes, but have only monochromatic vision. Some are sharp-sighted and can make out objects from far away—blackbuck, monkeys and members of the dog family, for instance. Such acute distant vision is of little use to forest dwelling animals whose outlook is circumscribed by the density of the cover they inhabit, and it is the animals of the open country and of the treetops that usually have it.

It is unwise to generalise about such things, but most animals lack the human ability to pick out static objects clearly when looking at them, though they are quick to make out anything that moves; a few like the greater cats, can also make out immobile objects. To a predator looking for prey, as well as to prey species on their guard against enemies, the instant spotting of movement is of far greater survival value than, say, the ability to read fine print.

This truth must be appreciated to know how vital vision is even to those animals, like elephants and gaur, whose primary sense is smell. Such animals are apt to overlook a perfectly immobile man so long as they have not been apprised of his presence already by some other sense, provided his garments blend with the surroundings—even elephants and gaur will notice a man standing stock still in a forest clearing dressed in spotless white. However, what is much more interesting is the fact that even when they have been warned by smell or hearing of the near presence of an intruder, such animals usually turn round to stare at the intruder to seek visual confirmation of the warning already received through more sensitive perceptions.

In fact, vision is quite as important to many forest-living animals, like sambar, gaur and elephants, whose sight is not too keen, as to beasts whose primary sense is sight, in the communication of intraspecific signals, warnings and personal approaches, for such signals and announcements are usually apprehended visually. Neither the existence of vocal and other means of communication, nor the comparatively poor vision of some animals detracts from the free use and importance of intraspecific visual communications.

Displays and expressive attitudes and actions that catch the eye and serve to communicate social warnings, or leads, or more personal announcements, are common among most mammals, especially those that are gregarious or which live in groups rather than by

themselves. These cannot be classified strictly into social and personal communications, since the same or similar displays or signals are used at times for both purposes, but we may consider them in that order.

Most social alarms are communicated vocally, but some are also conveyed visually. Many animals lift their tails up at the moment of flight from any apprehended danger; hares, chital, gaur and elephants, for instance, do so. When the tail is short and its under surface is conspicuously white or light coloured, as in hares and most deer, this sudden erection of the tail is most effective as a hoisting of flags of alarm and serves to warn of danger as well as to direct flight. A large herd of chital, coming upon something that frightens it suddenly, does not sound shrill alarm calls in unison, but scatters in flight with the tails suddenly elevated; usually the herd splits into parties in flight, when the upraised, conspicuously white tails serve to guide the animals in the rear of each party.

The quick raising up of the tail in a party or herd of gaur galloping away from what alarms them serves a similar purpose; further, the sudden outflinging and raising of the tail warns the other gaur, around the one that perceives the alarm, instantly of the danger. Wishing to secure a photograph clearly showing the panic elevation of the tail at the moment of flight. I crept along the ground through the tall grass bordering a stream towards two cow elephants on the other bank, drinking at the water, taking care to keep the wind right, and when I stood up and walked on to a clearing and they saw me unexpectedly. I got the picture reproduced here.

Flight, per se, is an effective and immediate visual alarm. Animals in a herd are instantly alerted when one of them bolts. A rather remarkable visually communicated warning I have observed in gaur and elephants, when the danger is not immediate, is what may be termed the deliberate recall. A bull gaur grazing by himself on a knoll above the herd (which was in a meadow below a tree forest), spotted me crawling through the cover towards the herd; he came down to the herd, stood broadside on to it, and then climbed up to the tree cover, when the rest followed him into the forest. I have observed many similar recalls among gaur and elephants.

When a herd is browsing or grazing strung out, and one of the socially dominant members wishes to move on to new ground, it just walks on along the line it wishes to take, as conspicuously as circumstances permit, and in due course the rest follow; it is usually an old female that gives this lead, but it may also be the dominant male in the herd or party. This may be observed among monkeys, elephants, gaur, deer and gregarious antelopes.

Before going on to visual intraspecific personal communications, the utilisation of special pelage patternings in social and familial life may be mentioned. These, unlike alarm and threat signals, are not actively displayed, in most of the greater cats, the dorsal



Elephants elevating their tails in panic flight.



Rear view of young tiger to show conspicuous ear-spots.

surface of the ear is heavily rimmed with black, with a central light-coloured spot; these ear-spots are specially conspicuous in the tiger. When a tiger is following another, creeping through cover, as when cubs are following their mother, these ear-spots, seen from behind, must be useful in sighting the leading animal.

Most mammals are coloured darker on their upper surfaces (as on the back and sides), and are much lighter below, so that when they are lying down or crouching in cover, they are less easily seen; it should be realised that being colourblind, most animals go more by tonal contrasts than by colour contrasts in sighting other animals. The lighter colour of the underside of the tail (mentioned already), pale-coloured rump patches, and the tassel of hair at the tip of the tail, as also the lighter colour of the limbs below the hocks, are all no doubt of use in sighting the leading animals when a herd or party is on the move, as also the conspicuous movements of the tip of the tail.

Intraspecific threat displays can be more pointed than something visually apprehended: a lioness or a tigress may rebuke her cubs with a cuff, or a big gaur cow prod a lesser member of the herd shrewdly in the hindquarters with her horns to convey some pointed direction. Nevertheless, most such attitudes and displays of threat, dominance and subordination are visually communicated. Snarling, apart from the vocal production of a threat, results in an unmistakable visual threat-expression, by the retraction of the lips to expose the teeth and the ridging up of the nose, and is commonly indulged in by animals of the cat and dog families; further, among all cats, a rapid, sparing pass with a paw is frequently directed at the adversary, a gesture strikingly similar to the display of a clenched fist among us. Horned animals lower their horns or antlers in a sweeping pass at the adversary in a very similar threat-gesture, and sambar hinds run at some subordinate in the party they wish to direct with their mouths open and the teeth on the lower jaw exposed in a bite-threat. Note that all these intimidatory displays are obvious in their hostile intent and stop short of the actual infliction of the threatened punishment.

Among deer, the raising of the neck and body in a stiff, stilted manner, with the head pointing up or down, results in dominance or threat displays which have been elaborately described. An aspect of such threats that may be mentioned here is purely ocular, the rolling of the eyes to display the whites. A pointed long stare, a regular glare, is also used by some animals as an intimidatory expression.

Placatory and suppliant expressions, which so often serve the important function of warding off actual combat and injury, are usually through displayed attitudes rather than actions. Among the greater cats, the suppliant animal may lie down on its back, belly upside, and roll on the ground with its paws in the air. Among members of the dog family, the passive exposing of the neck to the threatening jaws of the adversary inhibits aggression, and among monkeys the presentation of the hindquarters to the dominant

aggressor serves to placate it through a symbolic submissiveness that is sexual only in its symbolism and not in fact. There are many other displays of submissiveness among mammals, and other placatory attitudes.

Courtship displays among mammals are apprehended more through other senses (notably, the sense of touch) than sight, and through behaviour-patterns—the running away or receding by the female and the running after or the following up by the male is a familiar behaviour—pattern in courtship. However, certain bodily attitudes are also visually communicative in courtship.

The attitude of an animal is also often indicative of its mood, it is not only men who sit slumped in dejection—most depressed and sick animals also do so. Further elation or excitement is conveyed by a prancing gait, and suspicion by tense alertness.

(*Courtesy—I.T.I. Magazine*)

(*To be continued*)

Princess Grace of Monaco will no longer wear the furs of animals threatened with extinction. Elizabeth Taylor, Virginia Mc-Kenna and Mia Farrow have also renounced the furs.

Reptile Fauna of Dehra Dun District (Uttar Pradesh) Part-I

By

R.K. BHATNAGAR*

SUMMARY

The paper gives the first systematic account of lizard fauna of Dehra Dun district and records the occurrence of 11 species comprising 5 families, which are as follows:—
(1) *Hemidactylus brooki* (2) *Hemidactylus flaviviridis* (3) *Calotes versicolor* (4) *Agama turberculata* (5) *Mabuya dissimilis* (6) *Mabuya macularia* (7) *Leiolopisma himalayanum* (8) *Riopa punctata* (9) *Eumeces taeniolatus* (10) *Ophisops jerdoni* (11) *Varanus monitor*. Observations have also been recorded on variations in lepidosis, colouration, certain ecological features and distributional range of these species in the Western Himalayas. Besides this, it also gives the history of earlier herpeto studies on the fauna of the Western Himalayas and Nepal. The references (synonymies) have been cited under the description of each species.

Introduction

Herpetological studies on Himalayan fauna have been sporadic and scattered in various publications. Earlier works are mainly on the fauna of Eastern Himalayas viz. Blyth (1851), Gunther (1861) and Wall (1907, 11)¹ with casual reference to the fauna of Western Himalayas. While the works of Blanford (1875), McMohan (1899 & 1901)², Ingoldby & Procter (1923) and Hora (1923) deal with the fauna of extreme North and of extreme Northwest Himalayas, the fauna of Western Himalayas is known only from the works of Annandale (1907) who listed few lizards from Mussoorie (Dehradun district). In mainly dealing with the fauna of Nepal, Parshad (1914) gave a list of lizards only from Simla Hill States while Acharji & Kripalani (1951) dealt with the herpetological collections made from some localities in Kangra and Kullu valleys in the year 1951.

A number of research papers have appeared on herpetofauna of Nepal and are still appearing since the first publication of Cantor (1839) followed by Gray (1844 & 45, Gunther (1858, 60 & 61), Annandale (1907), Polunin (1951), Houston *et al* (1955), Smith (1951), Smith *et al.* (1963), Swan (1961) and Swan *et al.* (1962). These publications have given valuable help in the present study.

*Present address:— Jr. Ecologist (Vertebrates), Entomology Division, Indian Agricultural Research Institute, New Delhi-12.

1. Wall, F. (1907-11) Papers in *J.B.N.H.* Volumes on snakes.

2. McMohan A.H. (1899). *J. Asiat. Soc. Bengal* LXVIII (II), P. 105-9 Ibid. LXX (II), P. 1-7.

Smith's Fauna of British India Series (1935, 39 & 43) are widely used for purposes of identifications all over the Indian subcontinent. Though Smith's contribution to Asian Herpetology is the most dependable, authoritative and exhaustive work, yet it fails to serve the individual purposes of a worker of a particular locality as Swan *et al.* (1962) have rightly remarked "it was obviously impracticable for Smith to give the detailed locality, date and available ecological information for all the material he examined."

Information on the altitudinal distribution of reptiles of Himalayas is also scarce. The first publication on the subject was by Gunther (1890) which mainly dealt with the fauna of the Eastern Himalayas. Smith's Fauna of British India Series only provides the distributional range with a cursory reference to altitude at places, while Swan *et al.* (1962) exclusively deal with the fauna of Nepal.

Thus we find that not much information is available about the fauna of Western Himalayas of India and the present study is an attempt to fill the gap. It is hoped that this work though incomplete in certain respects will go a long way in meeting the desired needs of future workers so far as the faunal studies are concerned.

The present paper deals with the first part of reptile fauna of Dehradun district. The collections were made during the years 1960-67 by the Northern Regional Station, Zoological Survey of India, Dehra Dun.

The collection is referable to 11 species comprising 5 families:

Sub order *Sauria*

Family	(1)	<i>Gekkonidae</i>	...	...	2	species
	(2)	<i>Agamidae</i>	...	...	2	"
	(3)	<i>Scincidae</i>	...	...	5	"
	(4)	<i>Lacertidae</i>	...	...	1	"
	(5)	<i>Varanidae</i>	...	...	1	"

In citing the references under each species, only the first references on the species from North, Western and Nepal Himalayas have been mentioned. All measurements have been taken by callipers; decimal points have been ignored, and the figures rounded off to the nearest mm.

The following abbreviations have been used:—

Lepidosis:—UL., Upper labials; LL., Lower labials; L., Labials; V., Ventrals; A., Anal; Cau., Caudals; D., Divided.

Age:—Ad., Adult; Juv., Juvenile; Un., Unsexed.

Climatic and topographical conditions

District Dehradun lies between 77°35' and 78°27' east longitude and 29°57' and 31°2' north latitude. It is one of the northern-most districts of Uttar Pradesh. It is surrounded on

the northeast and southeast by Garhwal district and on the northwest by Himachal Pradesh, while on the south it adjoins Saharanpur district. To its north and east are the Himalayas and the south-east to south-west boundaries are the Siwalik hill ranges. The valley so known as the Doon valley is thus formed and the district covers an area of 3089.5366 Sq. kilometres. The area is broadly divisible into three zones; the southern Siwalik hill zone, a middle zone of the valley proper and the northern zone of the lower Himalayas. The principle rivers flowing through the district are the Ganges on its eastern boundary, the Yamuna on its western boundary and through the valley itself, the rivers Tons, Asan, Suswa and Song. Besides these rivers there are many seasonal rivers (locally known as "rao") which flow through the district. The river banks are chiefly covered with boulders, medium sized stones and pebbles of lime stones. In general the deposits are boulderous, covered with a thin layer of soil but in the northern zone the soil is sandy with gravels. The average rainfall is about 116 cms. in a year. Winters are severe in the northern zone and moderate in the valley proper. Summers are more or less moderate all over the district.

Collection localities

The following is the list of collection localities with altitudes, in metres, as taken from the Survey of India Maps:—

Name	Altitude above sea level in metres	
1. Ballupur	...	647.70
2. Bhagwantpur	...	914.40
3. Chakrata Cantt.	...	2187.24
4. Chakrata Town	...	2022.35
5. Chiriamandi	...	708.96
6. Dehradun	...	768.18
7. Dharamawala	...	716.28
8. Doiwala	...	490.11
9. Forest Research Institute campus	...	655.42
10. Garhi	...	680.00
11. Herbertpur	...	457.20
12. Kalsi	...	477.93
13. Kansrao	...	459.68
14. Karanpur	...	685.80
15. Koelpura	...	673.60
16. Masandhanwala	...	672.39
17. Majra	...	610.20
18. Manjhara	...	1524.00
19. Mohund	...	609.60

20.	Mohund Tunnel	...	...	888.79
21.	Motichur	...	...	727.54
22.	Mussoorie	...	...	2112.87
23.	Mussoorie Kempty Fall Road	...	...	2003.44
24.	Nun River Bank (nr. Masandhanwala)	...	...	614.17
25.	Raipur	...	...	651.35
26.	Rajpur	...	...	1037.54
27.	Rishikesh	...	...	367.16
28.	Sahasdhara	...	...	801.00
29.	Sahiya	...	...	1091.71
30.	Timli	...	...	651.06
31.	Tons River Bank	...	...	614.17

II. SYSTEMATIC ACCOUNT

Order:—*Squamata*

Sub order:—*Sauria*

Family:—*Gekkonidae*

Genus:—*Hemidactylus* Oken 1817

(1) *Hemidactylus brooki* Gray

1845. *Hemidactylus brooki* Gray, *Cat. Liz. Brit. Mus.*, London; p. 153. (Borneo: London)
 1923. *Hemidactylus brooki*, Hora, *Rec. Indian Mus.*, 25, p. 372. (Choa, Saidan Shah)
 1935. *Hemidactylus brooki*, Smith, *Faun. Brit. India, Rept. & Amph.*, London 2, p. 89
 1951. *Hemidactylus brooki*, Acharji & Kriplani, *Rec. Indian Mus.*, 49 (2), p. 178. (Mandi & Joginder Nagar)
 1962. *Hemidactylus brooki*, Swan & Leviton, *Proc. California Acad. Sci.*, (4) 32 (6), p. 32. (West & Central Nepal)

Material examined:—One ♂, Raipur, 20. IV. 1961; One UN (Juv.), Raipur Canal banks, Raipur, 27.XI.1961; One ♀, Nun River bank, Masandhanwala, 3.I.1962; One ♂ (Juv.), Premises of Northern Reg. Station, Zoological Survey of India, Dehradun, 24.VI.1964; One ♂ and one ♀ (both Juv.), Sahasdhara village, 2.VII.1964; One ♂ Dehradun town, 9.VII.1964; One Un. (Juv.), 15.VII.1964; One ♀, Song River bank, 8.XII.1964.

Labials:—Uppers 10 to 11 and lowers 8 to 10.

Preano femoral pores:—10 to 11 on each sides in males.

Measurements:—Snout to vent 37–41 mm in males and 35–41 mm in females.

Remarks:—The specimens dealt herein differ from those of Kangra and Kullu valleys (examined by Acharji *et al.* 1951) in labial counts (uppers numbering 8–10 and lowers 7–9); preano femoral pores (varying from 10–13); and general measurements, male being 48–65 mm and females 42–58 mm.

This species is widely distributed in the district of Dehradun and is often found underneath stones lying on the river banks. It has previously been recorded (Acharji *et al.* 1951) from Manali and Joginder Nagar areas of the Western Himalayas; Choa Saidan Shah, Punjab Salt Range (Hora, 1923) now in Pakistan and Nepal and its distribution is typically oriental or panoriental (Swan *et al.* 1962); and in the Eastern Himalayas the species has been recorded in North-East Assam (Smith, 1935).

(2) *Hemidactylus flaviviridis* Ruppell

1835. *Hemidactylus flaviviridis* Ruppell, *Neue Wirb. Faun. Abyss. Frankfurt*, p. 18, pl. VI
 1923. *Hemidactylus flaviviridis*, Hora, *Rec. Indian Mus.* 25; p. 25. (Kherwa, Sind)
 1935. *Hemidactylus flaviviridis*, Smith, *Faun. Brit. India, Rept. and Amph.*, London, 2; p. 98
 1962. *Hemidactylus flaviviridis*, Swan & Leviton, *Proc. California Acad. Sci.* (4) 32 (6) p. 139.

Material examined:—One ♀, Dehradun, 13.IV.1960; One ♀. Botanical Gardens, Forest Research Institute, 9.V.1961; one ♂, Raipur, 10.V.1961; one ♂, date ?, one ♀, Sahasdhara village, 21.XI.1963; one ♂, premises of North. Reg. Sta., Zoological Survey of India, 28.VII.1964; one ♀, 26.VIII.1964 and one ♀, 27.VIII.1964 locality same as preceeding.

Labial:—Uppers 12 to 15 and lowers 10 to 13.

Lamellae:—8–10 under 1st toe and 11–13 under the 4th toe.

Preano femoral pores:—5–6 on each sides in males.

Measurements:—Snout to vent 67–70 mm in ♀ and 44–70 mm in ♂.

Remarks:—This species is widely distributed in Dehradun district and appears to be the commonest house gekko in Doon valley. It has previously been recorded from Kherwa, Sind (Hora, 1923).

Family: —*Agamidae*

Genus:—*Calotes rafinesque*

(3) *Calotes versicolor* Daudin

1802. *Agama versicolor*, Daudin, *Hist. Nat. Rept.* 3; p. 395 pl. xiv. (Type loc: Paris)
 1845. *Calotes versicolor*, Gray, *Cat. Lizards. Brit. Mus.*, London; p. 243. (Nepal)
 1860. *Calotes versicolor*, Gunther, *Proc. Zool. Soc. London; 1860*; p. 215. (Nepal)
 1864. *Calotes versicolor*, Gunther, *Rept. Brit. India London*; p. 215. (Nepal)

1907. *Calotes versicolor*, Annandale, *Rec. Indian Mus.* 1; p. 153. (Kathmandu)
1914. *Calotes versicolor*, Parshad, *Rec. Indian Mus.* 10; p. 367 (Saujauli, Kufri)
1923. *Calotes versicolor*, Hora, *Rec. Indian Mus.* 25; p. 25. (Sardhi & Nurpore)
1935. *Calotes versicolor*, Smith, *Faun. Brit. India. Rept. and Amph.*, London, 2; p. 189
1951. *Calotes versicolor*, Smith, *Ann. Mag. Nat. Hist.*, 12 (4); p. 729. (Rasua, Garhi district)
1951. *Calotes versicolor*, Acharji & Kripalani, *Rec. Indian Mus.*, 49; p. 178. (Binwa Khad at Baijnath, Kangra district)
1953. *Calotes versicolor*, Smith & Battersby, *Ann. Mag. Nat. Hist.*, (12) 6; p. 703. (Lapha, Karnali valley. Nepal, alti. 1219.20 mtrs)
1956. *Calotes versicolor*, Leviton, Myers & Swan, *Occa. Paps. nat. Hist. Mus. Stanford University*, (1); p. 10. (Nepal: Dharan, alti. 457.20 mtrs.; Arun valley, alti. 304.80-609.60 mtrs.; nr. Khanbari, alti. 914.40-1219.20 and 2133.60 mtrs.; below Yetung, alti. 1219.20 mtrs.)
1962. *Calotes versicolor*, Swan & Leviton, *Proc. California Acad. Sci.*, (4) 32 (6); p. 110 (Eastern & Central Nepal)

Material examined:—One Un. (Juv.), Subhash Nagar, 5.X.1960; one ♂, Song river bank, 8.XII.1960; one ♀, premises of Northern Regi. Station, Zoological Survey of India, 22.XII.1960; one ♂ and one Un. (Juv.), Chiriamandi, 10.II.1961; one ♀, campus Forest Research Institute, 27.III.1961; two ♂, locality same as preceeding, 9.V.1961; one ♀, Raipur village, 10.V.1961; two ♂, Hertionwala Tea Estate, 19.V.1961; two ♀, Ballupur nr. Chakrata Road crossing, 14.VI.1961; one ♂, Botanical Gardens, Forest Research Institute, 9.IX.1961; one ♀, Rajpur nr. Mussoorie Road, 21.V.1962; one ♂, Sahasdhara village, 7.II.1964.

Labials:—Uppers 9-11 and lowers 9-10.

Iympanum:—Half the length of the eye.

Body scales:—34-52 round the body. In adults, dorsal keeled scales at the flanks are slightly larger than the ventrals, while in juveniles dorso-laterals and the ventral ones are subequal.

Measurements:—Snout to vent 90-250 mm in males and 60-230 mm in females.

Colouration:—Uniformly brown in adults, sometimes pinkish-brown during breeding season; juveniles mostly, little dark brown and occasionally with two dorsal brown streaks interrupted by white patches on dorso-median scales.

Remarks:—In specimens collected during February and March, testes are swollen and gular folds are developed. Very likely the breeding season commences in February or March for 7–10 eggs in various stages of development were found in specimens collected during the period.

This species is widely distributed in the Doon Valley though rarely met with at high altitudes and is rarely seen in the area occupied by *Agama* species. The species has an exceptionally wide distribution in the Indian region; in the Himalayas, it has been recorded in the east, west and extreme north-west. In the extreme north-western Himalayas the species has been recorded from Baluchistan and Sind (now in Pakistan) and in South Waziristan; in the western Himalayas the species has been recorded from Baijnath in Kangra district and Kathmandu in Nepal. Swan and Leviton (1962) have observed its distribution as typically oriental.

Genus:—*Agama* Daudin

(4) ***Agama tuberculata*** Gray

1827. *Agama tuberculata* Gray, *Zool. Journ.* 5, London; p. 218; *illus. Indian Zool.* 2. pl. I and XII (1830.35). (Type loc: Bengal)
1853. *Stellio indicus* Blyth, *J. Asiat. Soc. Bengal*, 12; p. 646. (Type loc: Upper Hindustan)
1860. *Barycephalus sykessii* Gunther, *Proc. Zool. Soc. London*, 1860; p. 150, pl. XXV, fig. A. (Type loc: Simla: London)
1871. *Stellio dayanus* Stoliczka, *Proc. Asiat. Soc. Bengal* and *J. Asiat. Soc. Bengal*, 4th May, 1872; p. 113, pl. 3, fig. 4. (Type loc: Hardwar, U.P.)
1907. *Agama tuberculata*, Annandale, *Rec. Indian Mus.* 1, p. 154. (Chitlong, Little Nepal Valley; Simla, alti. 2438.40 mtrs. and Kumaon as low as 1219.20 mtrs.)
1914. *Agama tuberculata*, Parshad, *Rec. Indian Mus.* 10, p. 368 (Kasauli, Simla)
1935. *Agama tuberculata*, Smith, *Faun. Brit. India, Rept. and Amph.* 2. London; p. 214. (Kashmir to Kathmandu)
1951. *Agama tuberculata*, Acharji & Kripalani, *Rec. Indian Mus.*, 49 (2), p. 178. (Neugal Naddi, Palampur, Kangra district; Binwa Khad at Baijnath, alti. 1005.84 mtrs.; main stream of river Beas and its tributaries at Kullu; Katrain nr. Naggar, alti. 1463.04 mtrs. and road from Naggar to Manali, alti. 1889.76 mtrs.)
1951. *Agama tuberculata*, Smith, *Ann. Mag. Nat. Hist.*, (12) 4; p. 728. (Chatekhola, Rasua Garhi district, alti. 213.36 mtrs., Nepal)

1953. *Agama tuberculata*, Smith & Battersby, *Ann. Mag. Nat. Hist.* (12) 6; p. 703. (Nepal: Karnali valley, alti. 1219.20 mtrs.)
1956. *Agama tuberculata*, Leviton, Myers & Swan, *Occa. Paps. Nat. Hist. Mus. Stanford University*, (1); p. 10. (Nepal: Dharan, alti. 457.20 mtrs.; Arun valley alti. 304.80–609.60 mtrs; nr. Khanbari, alti. 914.40–1371.60 and 2133.60 mtrs. and Yetung, alti. 1219.20 mtrs.)
1962. *Agama tuberculata* Sawin & Leviton, *Proc. California Acad. Scin.* (4) 32 (6); p. 110 (Central & Western Nepal)
1967. *Agama tuberculata*, Bhatnagar, *Cheetal, J. Wild Life Preserv. Soc. India* 10 (1); p. 39 (Dehradun: Chakrata, alti. 2187.24 mtrs.; Sahiya, alti. 1092.71 mtrs.; Mussoorie, alti. 2112.87 mtrs.; Rajpur, alti. 1037.54 mtrs.; Manjhara, alti. 1524 mtrs.; Sahasdhara, alti. 801 mtrs.; Maldevta, alti. ?; Raipur, alti. 651.35 mtrs.; Rishikesh, alti. 365.76 mtrs.; Kalsi, alti. 477.93 mtrs.; Dakpatthar, alti. 304 mtrs. and Saharanpur district: Lall Pull area, Raja ji Sanctuary, Saharanpur Forest Division, alti. 600 mtrs.)

Material examined:—One ♀, Rahankhera Chakula, Chakrata, 12.VI.1962; two ♂, Sahiya village, 7.VIII.1962 and 385 ♀, and 328 ♂, Sahasdhara village, collected throughout the years 1961–1965 in connection with the studies on biology and ecology of the species details of which have already been published by the author (1967–68).

Lepidosis:—Nostrils on *Canthus rostralis*; head scales keeled, somewhat hexagonal; 10–12 supra labials; scales on tympanum margin and on occipital region are spinose and keeled; tympanum large superficial and as large as the eye: nuchal skin loose but no gular sac, nuchal scales small, keeled and hexagonal; median dorsal scales 10–15 in horizontal series; scales on flanks keeled, slightly bigger than nuchals and median dorsals Inter-mixed with enlarged keeled scales. Tail scales strongly keeled, arranged in segments of whorls with 6–10 scales in each segments. Tail oval at base and nearly round at the tip.

Colouration:—Smith (1935) describing colour states “in life, shoulder, breast and flanks have bright yellow orange spots. In adult males, the whole of the under-parts become bluish-black, brightest and tinged with purple on the throat, sides of neck shoulders and belly. An adult male is really a gorgeously coloured lizard (Stoliczka, 1872).” Bhatnagar (1967) has observed in the Doon valley, the gorgeous coloration of the male—the ultramarine blue tinge on the neck, nape, upper sides of limbs, flanks and on the dorsilateral sides of the tail, is not a constant coloration. This coloration is present during the days when sunlight is bright, otherwise and normally the coloration remains dull grey. Annandale (1907) has observed a difference in coloration in the specimens from Kumaon and Nepal compared with those of Simla. He observed, “the eastern race of the species is

of a very dark state colour, with numerous spots and blotches of yellow; while in the Simla form the back is of a rather pale brownish grey with fewer and less conspicuous spots. The Simla form is also more agile and wary than the eastern form."

Measurements:—Sexually mature males, from snout to vent 100–150 mm and females 105–160 mm. Maximum tail length observed is 255 mm.

Remarks:—The author, (1967) has reported detailed studies on the biology and ecology of the species.

Present distribution of the species, from extreme north-west Himalayas to Nepal Himalayas is as follows:—Kabul, Quetta, Balti, Ladhak and Tibet, Alpine Punjab, Kashmir, Kullu, Katrain, Nagar and Manali, Simla, Dehradun, Garhwal, Kumaon, central and western Nepal.

Altitudinal distribution has been observed by Gunther (1860) from 762 to 4648.20 mtrs. and the lowest altitudinal distribution has been recorded from the Saharanpur Siwaliks by Bhatnagar (1967).

(To be continued)

A Marine National Park

By

A.G. RADDI

The object of various national parks and wild life sanctuaries that have been set up in India, it is understood, is basically to ensure that the variety of our wild life and its habitats are preserved in a natural undisturbed conditions in perpetuity for the benefit of mankind. Considering the rapid rate with which industrialisation is advancing, altering the environment, such areas have acquired immense value. Not only are they expected to function as islands of natural beauty and tranquility, providing aesthatic joy to people who visit them, but the planned research work undertaken in these areas ought to considerably help in our understanding of the natural environment that is around us, enabling us to better appreciate and manage it. In the highly industrialised and mechanised society of today such an understanding is vital for human welfare. A look at the distribution of our existing National Parks and wild life sanctuaries however makes it obvious, that an overwhelming number is concentrated in the forested regions—particularly in the Peninsula—and thus by and large protecting and displaying the peninsular wild life forms. An important aspect of the Indian environment that appears to have been overlooked is the Marine habitat. Considering the fact that about two third of the earth's surface is covered by the ocean and noting the large coast line that our country has, this does not appear right.

The marine environment encompasses within itself a great diversity of habitats and forms. The sea coast for example has its own characteristics. The gently swaying casuarinas, the tall coconut palms and the other botanical types found in this region have a beauty and character of their own. The colourful shells of various marine invertebrate forms that lie washed ashore on the beaches, are fascinating in their infinite variety and colouration. The driftwood that is found on the beaches, often exhibits graceful artistic patterns and forms good enough for it to be displayed as drawing room exhibits. A walk along the sandy shore is a refreshing experience. Here one can watch Ghost crabs scurrying about on the sandy expanse only to dash down into their burrows at the slightest hint of danger. The vast sandy expanse also supports many other kinds of burrowing life forms.

The intertidal zone, exposed rhythmically to alternate wetting and drying due to the tide action, exhibits a fauna particularly adapted to the situation. This may consist of barnacles encrusting rocky surfaces and crustaceans etc. hiding under the rocks.

The rock pools, found at low tides in the intertidal region, are also fascinating in terms of life forms that they display. The pool bottom may be carpeted by a variety of sea

weeds, and forms like sea urchins, seacucumbers, starfish, gorgeously coloured sea anemones and sponges occur in such pools. Small fish dart in and out of the sea weeds and one may also see hermit crabs occupying abandoned molluscan shells, moving slowly along the bottom. Overturning rocks in such pool may reveal new forms sheltering under it, e.g. variety of gobioid fish, colourful planarians or annelidan forms crawling along the rock surface. The main oceanic water mass itself has a fantastic diversity of vertebrate and invertebrate forms. The distribution of these forms; depends on the oceanic currents and the organism's specific physiological adaptations. Amongst these are included the astronomical number of planktonic forms that passively drift along, and the numerous fish forms that feed on them. The diversity of these types in terms of their colour, feeding habits, life cycle, relationships with other organisms in the environment as well as the physico-chemical aspects of the environment itself is a fascinating study in marine biology.

All this diversity of interesting life forms needs to be properly protected at least in a well designated marine sanctuary or a marine national park. It is realised that it is impossible to confine the drifting or free moving marine forms to the limits of the proposed sanctuary; but the protection from wanton interference (fishing, pollution, collection of shells, and zoological specimens) if offered to a part of our marine environment will contribute a great deal not only to the conservation of many marine forms but also greatly facilitate their study and bring about a deeper understanding of this environment. Thus on grounds of proper conservation alone setting up of a marine sanctuary or a national park is justified. When one adds to this the touristic significance of such areas the case becomes irrefutable.

It is a well known fact that many tourists, foreign as well as domestic, like to relax on the beaches, for the purpose of sun bathing, swimming, and related aqua sports like snorkeling, goggling, skin diving and sports fishing.

India has a large coastline, alongwith which are located many pretty beaches. The beach at Kovalam in Kerala as well as some of the beaches in Goa are being developed as major beach resorts. When completed they will have accommodation in the form of modern hotels and cottages and other required tourist facilities. At kovalam, a yoga-cum-massage centre will also function and will provide a new experience for the tourist and enable him to benefit from the traditional Indian methods of maintaining body tone and health. With proper planning it may also be possible to provide adequate deep sea sports fishing possibilities near our beach resorts. Though, Marine sports fishing is a relatively new concept under Indian conditions; it could add a new, thrilling experience to tourists spending their holidays on our beach resorts-cum-marine sanctuary complexes. India today is capable of designing, manufacturing, and maintaining boats specially for the purposes of Oceanic sports fishing. Such fast boats would take interested tourists out 30 to 40 miles away from the coast, well out of the marine sanctuary premises, to the deep

sea fishing grounds. Here a sports fishermen could fish for giants of sports fishing world like Marlins, Tunas, Barracudas etc. However, to organise this properly and scientifically, data has to be collected and a watch has to be kept for the seasonal migrations of sports fish like marlin and sail fish—in the vicinity of our coastal resorts and promote planned marine sports fishing in this context; for the benefit of the tourists.

Taking note of the anticipated beach resort developments it does not seem far fetched to think of a situation along the Indian Coast where a beach resort and a marine sanctuary or national park exist together and function in a capacity complementary to each other. The beach resort providing the tourist facilities, by aesthetically blending the benefits of modern technology with the natural beauty of the coastal environment and making it available to the tourist for his holiday. The marine sanctuary on its part protecting a well designated segment of the marine habitat from wanton interference and making it available in its various facets to the visitors for the purpose of viewing of marine life (goggling, snorkeling, skin diving) as well as planned aquatic sports—like surfing, swimming, sailing etc. Sports fishing would of course be done in properly designated fishing grounds, well off the coast and away from the proposed marine sanctuaries and National Parks. At this stage a definite reference is also essential to the coral formations and their value to a marine sanctuary in terms of their fantastic beauty and tourist potential. Where as most of us have heard of coral reefs and coral islands not many know what corals really are. Corals are basically marine invertebrate forms related to sea anamones. They are colonial and each individual secretes around itself a protective layer of calcium carbonate. They generally occur in large colonies and their calcareous skeletons thus fuse together to form hard stony masses of great variety, colour and shape. The reef building corals thrive best in shallow waters and need a surface temperature of about 70°F.

A reef of living corals in terms of life it supports is truly like a beautiful garden. The variety of colour and form that it exhibits is overwhelmingly beautiful. Modern technology has made it simple to visit such underwater paradises.

One could catch glimpses of this fairy land while floating on the surface in a glass bottom boat, or alternatively make use of snorkeling and goggling equipment. Another comfortable way of observing beauties of this underwater world is to use aquanaut equipment. This essentially consists of a pump floating on the water surface. A full tank ensures that the pump will keep on working and pumping air in to a tube for one hour. The air tube from the pump could be of 30' to 50' in length and is attached to your goggles. Thus equipped you are free to dive in the emerald green waters, of crystalline purity and swim under water or sit on a coral for an hour watching life as it moves around you. The air tube enables you to move about within a distance of 30 to 50 from the Air pump—which

itself is floating on the water surface. If you are an expert swimmer and diver, you could strap oxygen cylinders to your back and swim freely and also make use of underwater scooters or Mini-submarines to speed up your underwater movements. Whatever the equipment used there is no doubt that the underwater world of coral wonderland is breathtaking in its beauty! The clear waters have good visibility and allow you to see upto 10' - 15'. The riot of colour—green, blue, yellow, exhibited by the corals, fishes, and variety of invertebrate forms the gently swaying fronds of underwater vegetation, the schools of brilliantly coloured fish that dart in and out of the coral forest, are somethings whose beauty has to be seen to be believed. Above all the underwater garden is silent. As one sits on a coral in these tranquil silent, and colourful environs, watching life forms exquisitely beautiful and coloured go about their normal activity one is overcome by a feeling of sublim bliss—rarely attained elsewhere. This is true communion with nature.

There must be many such coral areas around our coast line; and it would be well worth while to effectively survey them and designate outstanding representative areas as marine sanctuary or National parks. These can be linked up with a developing beach resorts. While undertaking this one would not only be helping to conserve an important aspect of our natural environment but also prove a new and delightful recreational experience for the tourists visiting India.

The Grey Goats of the Blue Mountains

By

PRIYADARSHINI DAVIDAR

The sky was blue speckled with occasional streaks of clouds. It was a beautiful day for a leisurely hike, but for a long trek it was too hot. We, my father, my brother Peter and I were on our way to see the elusive Nilgiri Tahr which live near the cliffs between Bangitappal and Sispara on the Western edge of the Nilgiri plateau 7500 ft. in height. Though I had seen Tahr before in Chinna Mukerti this was the first time I was camping out and covering vast stretches of Tahr country. We had taken along five days provisions, two tents, utensils etc. carried by some estate workers. There was also a guide with us.

The long tramp to the first camping ground was a muscle-aching sweating. It was just five miles of climbing up steep inclines and almost running down steeper declines. But this being my first camp my legs started giving way long before my spirits. Shikari Joe the guide led the way to the camping spot. Joe was reputed to know the 'Tahr' country better than the palm of his hand. He certainly lived up to his reputation.

The camping ground was picturesque and near a spring. It was previously a Toda mund which accounted for the lush bright green grass which carpeted the area. From the numerous tahr and sambar bones and hooves lying around we realised that it was the camping ground for poachers also. We pitched the larger tent in the middle of the clearing and my brother and I climbed down a couple of hundred feet to fish in the stream below. The stream was stony and shallow except in places where it had formed pools. There was stiff competition between us as to who would catch more fish. By dusk we had caught many small fish. That night after a dinner of fried trout, rice and sambhar (South Indian dish made of dhal), we went to sleep, or I should say tried to, as the single blanket on top and the meagre ground sheet below could not keep the cold out. I enviously pictured Joe and company snoring round the roaring fire.

Early next day we went on a long trek to spot tahr. Joe took the lead. Besides the binoculars he carried a kettle to make tea to refresh us whenever we felt tired. The day being fresh and the sun being young climbing was not gruelling. The ever changing scenery kept us from thinking of our exertions.

To describe the abode of the Tahr as just beautiful is an understatement. There are miles and miles of grass covered undulating hills or 'downs' which are broken by dense evergreen sholas in the hollows and valleys. In the sholas grow ancient-looking moss and lichen covered trees, on their branches can be found orchids which usually bear small pink or white flowers. The slender Arisaema sprouts up from the ground with its strange flower which looks like a cobra with its hood outspread. The insectivorous Drosera grows

by the side of the streams. There are numerous streams, the water is clear, fresh and has a refreshing taste. Vague, grey shadowy trout dart about in the larger streams. The undulating hills end abruptly in sharp cliffs, precipices of thousands of feet. The plains below the cliffs is Silent Valley in Kerala state. Silent except for the occasional calling of langurs, the trumpeting of elephants and the rush of wings as swallows hurl themselves into the depths below.

We get on to the Bangitappal bridle path which goes on to Nadgano and through the Sispara pass down to Kerala. The trail was used previously as the only 'tappal' or postal link between Kerala and the Nilgiris. We picture to ourselves the mail runners of those days with their heavy postal bags and jingling staffs. It is said that a mailman was eaten by a tiger and his bones remained scattered by the side of the trail for a long time. My father and Joe showed us the places along the trail where they had run into tigers on previous occasions. Joe showed us several places where he had helped sportsmen to shoot tigers, panthers and saddlebacks. We got to the edge of the cliffs to look for tahr. We spotted some on Kingdhar, the sausage hills because of their resemblance to a string of sausages stretch out to our left. It is said that tigers and elephants come up to the plateau from the Silent valley by the trail. No tiger showed up but there were traces of their having used it a fortnight or so previously. We stopped. Joe made tea. Thus refreshed we made our way back taking it easy.

No one knows how the Nilgiri Tahr (*Hemitragus hylocrius*), a near relation of the Himalayan Tahr (*H. jemlahicus*), came to be found so far South. Besides the Nilgiris it is found on selected craggy hills along the southern half of the Western Ghats. 'It is a short stocky goat with short coarse pelage. Pelage of subadults and young males is dusky brown and grey brown. The horn is short—12 to 16 inches in adult males, corrugated and sweep backwards. Adult males are dark brown, as they grow older they turn almost black and develop a patch of lighter coloured hair in the region of the rump, so are called 'saddlebacks'. The tahr population in the Nilgiris has remained fairly stable around 300-400. Its only predators being Man and the carnivores.

We found that the drawback in tahr country is that around 10 or 11 a.m. mist from the valley crawls up the cliffs, reaches the plateau and completely covers every hill and shola in a white blanket. There is nothing one can do except return—if you can find the way. This is where Joe proved most useful.

The third day we shifted camp to Emerypuzha and camped beside the stream in our little tent. That night was wet and miserable. It drizzled continuously, the tent leaked and most of the night we spent around the soggy camp fire drying our blankets. Next day Peter and I discovered a solitary trout in the Emerypuzha stream and became very familiar with it. It understood our evil intentions and swam contemptuously past our lures. We covered most of the fascinating country. Besides tahr we saw sambar.

We shifted back to spend the last night in the previous camping ground. There was a female tahr and its kid on the hill overlooking the camp. They remained there for quite some time, oblivious of our presence; the female lying around and the kid jumping around.

The last day we packed up and trekked to the Bangitappal bridle path. There we halted and fished in the Bhavanipuzha stream which ran alongside. The stream was tiny in places and the hook got hung up on trees on the opposite bank. By this time Raju, one of the porters had become an expert retriever.

We walked along the trail through sholas and clumps of hill bamboo, and the stream kept us company weaving in and out of the sholas. Living out in the isolated, wild and beautiful part of the Nilgiris was an exhilarating and an unforgettable experience. I hope to go there many more times in future.

Musk As An Important Commercial Wild Life Product

By

*R.K. BHANOTAR AND R.K. BHATNAGAR

1. Introduction

India with her varied and rich wild life fauna is exporting various Wild life products, such as skins of various Mammals and Reptiles, feather and plumes of various Birds, Musk horns and hairs etc. to various countries. The figures for the year 1967-68 reveal that revenue obtained by exporting various wild life products had earned India, about 13 crores of Rupees in Indian currency.

The present account deals the 'natural musk' as an important wild life product exported by India and the revenue it fetches in return and the suggestion for its farming.

2. Musk as a wild life product

Musk is the dried secretion from the pre-putial follicles of Musk Deer, *Moschus moschiferus* Linnaeus, and is obtained from the musk gland situated beneath the skin of abdomen of males (Prater, 1948). When fresh its secretion has an unpleasant smell, when dry it acquires the smell of musk.

The musk deer inhabits the high altitudes, above 2,500 metres (Khajuria, 1963) in the Himalayas from Kashmir to Sikkim. Prater (1948) recorded that it is generally met within birch forest above the zones of the pines, at times they come to lower levels but always keep to thick cover. It lives singly or in pairs and domestication of this species is not so far recorded.

(i) Types of musk

Three types of musk is available and the graded quality being exported thus:

- (a) Assam black-I
- (b) Nepal blue-II
- (c) Kashmir whitish yellow-III

All the types are exported in glass capsules.

(ii) Uses of musk

On the domestic front, musk was included in BPC 1934 in which some uses for musk were described as powerful 'stimulants' of medulla and in the treatment of hysteria. Musk is

*Present Address:—Entomology Division, Indian Agricultural Research Institute, New Delhi-12.

also used in cough, winds and fever. However the medicinal use is obsolete except perhaps its limited use in Ayurvedic and Unani systems of medicine and is sold in the market as follows:—

1. Brihat Kasturi Bhairava
2. Kasturi Bhushan
3. Salpha Kasturi Bhairava

The main use of kasturi or musk is in perfume industry as a fixative and base. It is bitter and pungent in taste.

3. Export of 'musk natural' during the last 5 years (April, 1964-March, 1969) from India

Musk as a wild life product is being exported from India to various countries. The Indian Board of Wild Life has allowed its consumption at home and export to the tune of 300 Kgms. (or about 3,00,000 gms) annually.

In the East, major quantity is being exported to Hongkong, Japan, Singapore, Malaysia and Nepal. In the West, the recipients are France, Switzerland, U.K., U.S.A., Canada, Germany DRP & FRP and Italy.

Year-wise export figures (Tables I & II) indicate that Japan and France lead in its major consumption.

(1) Quantity of Musk exported from 1964 to 1969

The quantity of Musk exported from India during the Years 1964 to 1969 is as under:—

Table-I

Sl. No.	Years	Quantity in Gms.	Percentage
1	1964—65	298000	17.30%
2	1965—66	22454	1.30%
3	1966—67	335761	19.49%
4	1967—68	408493	23.71%
5	1968—69	658266	38.20%

The total quantity exported during the last 5 years being 17,22,974 gms. and average per year being 3,44,594.8 gms.

(2) Revenue earned per year (in Rupees)

The value of exported musk per year for the last 5 years (1964-69) being as under:—

Table-II

Sl. No.	Years	Value per year (in Rupees)	Percentage
1	1964—65	935420.00	7.47%
2	1965—66	99805.00	0.80%
3	1966—67	2703089.00	21.58%
4	1967—68	2816222.00	22.49%
5	1968—69	5968726.00	47.66%

The total value earned by export for the last 5 years being Rs. 1,25,23,261.00. The revenue earned per year on an average being Rs. 2504652.2 (*Ca.* twenty five lakhs).

4. Conclusions

Valued for its commercial importance the species may be under severe pressure of extinction. It is suggested that efforts to domesticate this species and farming of Musk Deer on scientific lines by breeding it in captivity, by adopting scientific methods of extracting the musk without endangering the species, may be developed and undertaken, to fulfill the growing demand of the industry. The farming may also help in maintaining the balance of species in nature. However an immediate population census is called for.

Acknowledgement

Authors express their grateful thanks to Dr A.P. Kapur, Director, Zoological Survey of India, Calcutta; for providing all facilities.

References

1. Khajuria, H. 1963. *India's Wild Life* 61 pp. Delhi, (Govt. of India Press.)
2. Prater, S.H. 1948. *The Book of Indian Animals* xx 323 pp-Bombay, (B.N.H.S. Pub.).
3. Department of Commercial Intelligence and Statistics. 1964-69—*Monthly statistics of foreign trade of India. Vol. 1. Export and re-export—Delhi* (Manager of Publications, Govt. of India).

On Additions To the Fish Fauna Of North Bengal

BY

RAJ TILAK

*Zoological Survey of India, Calcutta**

I—INTRODUCTION

The fish fauna of eastern Himalaya and Assam hills is very rich (Hora, 1941) as compared to that of the rest of India and it is zoogeographically important because this area connects the Indo-Chinese, Indo-Malayan and Indian sub-regions of the Oriental region. In this connection the fish fauna of North Bengal has special significance. Shaw and Shebbeare (1938) gave an illustrated account of 131 species of fishes occurring in the rivers, streams, and ponds in the hills and plains of the Darjeeling district and the adjoining Duars. Later, Hora and Gupta (1941) reported 58 species of fishes from Kalimpong, Duars and Siliguri Terai area of North Bengal and made an addition of three species to the list of Shaw and Shebbeare (1938). Hora and Gupta (1941) further pointed out changes in generic and specific names of some species. Recently, during a check up of the fishes of North Bengal in the National Collections of Zoological Survey of India, Calcutta, the author discovered material of four species, hitherto unrecorded from North Bengal. This material is found in the registered collections and the identity of this material has been checked by the present author.

The author had also had the opportunity to study the fishes of North Bengal, collected by G.E. Shaw and E.O. Shebbeare at Darjeeling Natural History Museum, Darjeeling during 1972. It should be important at this stage to make a report on these additional species of fishes of North Bengal. Further, according to the recent rules of International Zoological Nomenclature, the author finds it necessary to make a few more changes in the generic and specific names of fishes of North Bengal given by Shaw and Shebbeare (1938) and Hora and Gupta (1941).

In this paper, therefore, an up-to-date list of fishes of North Bengal has been given. The fishes have been arranged according to the recent classification given by Greenwood *et al.* (1966). Shaw and Shebbeare (1941) have themselves confessed that they have included some species purchased only from the market and these could have been brought there by rail from other places. The presence or absence of such species can only be checked through a thorough survey of the fishes of Darjeeling district. The revised list given here should help any future venture in this direction.

*Present Address : Zoological Survey of India, 71, Chakrata Road, Dehra Dun (U.P.)

II—A REVISED LIST OF FISHES OF NORTH BENGAL

Of the 131 species listed by Shaw and Shebbeare (1938), two species, *Lepidocephalus annandalei* Chaudhuri and *Ompok pabda* (Hamilton), have been found to be synonyms of *Lepidocephalus guntea* (Hamilton) and *Ompok bimaculatus* (Bloch) respectively (Hora and Gupta, 1941). With the addition of 3 species by Hora and Gupta (1941) and 4 in the present paper, the total number of species from North Bengal, therefore, runs to 136.

Super-order.—Clupeomorpha

Order.—Clupeiformes

Sub-order.—Clupeoidei

Family.—Clupeidae

1. *Gadusia chapra* (Hamilton)
2. *Hilsa ilisha* (Hamilton)
3. *Goniolosa manmina* (Hamilton)

Family.—Engraulidae

4. *Engraulis telara* (Hamilton)

Super-order.—Osteoglossomorpha

Order.—Osteoglossiformes

Sub-order.—Notopteroidei

Family.—Notopteridae

5. *Notopterus notopterus* (Pallas)
6. *Notopterus chitala* (Hamilton)

Super-order.—Ostariophys

Order.—Cypriniformes

Sub-order.—Cyprinoidei

Family.—Cyprinidae

7. *Oxygaster bacaila* (Hamilton)
8. *Chela (Chela) laubuca* Hamilton
9. *Barilius (Barilius) barila* Hamilton
10. *Barilius (Barilius) barna* Hamilton
11. *Barilius (Barilius) bendelisis* Hamilton
12. *Barilius (Barilius) vagra* Hamilton
13. *Barilius (Barilius) titeo* Hamilton
14. *Barilius (Opsarius) bola* Hamilton
[= *Barilius (Raiamas) bola* Hamilton]
15. *Barilius (Barilius) shacsa* Hamilton

16. *Danio acqipinnatus* (McClelland)

17. *Danio dangila* Hamilton

18. *Danio devario* Hamilton

19. *Brachydanio rerio* (Hamilton)

20. *Esomus danricus* (Hamilton)

21. *Rasbora daniconius daniconius*
(Hamilton)

22. *Rasbora elanga* (Hamilton)

23. *Amblypharyngodon mola* (Hamilton)

24. *Aspidoparia morar* (Hamilton)

25. *Aspidoparia jaya* (Hamilton)

26. *Puntius apogon* (Valenciennes)

27. *Puntius conchoni* Hamilton

28. *Puntius phutunio* Hamilton

29. *Puntius sarana* Hamilton

30. *Puntius sophore* Hamilton

31. *Puntius titius* Hamilton

32. *Puntius ticto* Hamilton

33. *Chagunius chagunio* (Hamilton)

34. *Acrossocheilus hexagonolepis*
(McClelland) (= *Barbus (Lissocheilus)*
dukai Day)

35. *Tor putitora* (Hamilton)

- *36. *Tor tor* (Hamilton)

37. *Catla catla* (Hamilton)

38. *Cirrhinus mrigala* (Hamilton)

39. *Cirrhinus reba* (Hamilton)

40. *Crossocheilus latius* (Hamilton)

41. *Garra annandalei* (Hora)

42. *Garra gotyla gotyla* (Gray)

43. *Labeo bata* (Hamilton)

44. *Labeo boga* (Hamilton)
45. *Labeo balbasu* (Hamilton)
46. *Labeo dero* (Hamilton)
47. *Labeo dyocheilus* (McClelland)
48. *Labeo gonius* (Hamilton)
49. *Labeo nandina* (Hamilton)
50. *Labeo pangusia* (Hamilton)
51. *Labeo rohita* (Hamilton)
52. *Osteobrama cotio* (Hamilton)
53. *Semiplotus semiplotus* (McClelland)
54. *Schizothorax molesworthi* (Chaudhuri)
55. *Schizothoraichthys progastus*
(McClelland)

Family.—Psilorhynchidae

56. *Psilorhynchus balitora* (Hamilton)
57. *Psilorhynchus sucatio* (Hamilton)

Family.—Homalopteridae

58. *Balitora brucei* (Gray)
- **59. *Balitora maculata* (Gray)

Family.—Cobitidae

60. *Aborichthys elongatus* Hora
61. *Acanthopthalmus pangia* (Hamilton)
62. *Botia dario* (Hamilton)
63. *Botia dayi* Hora
64. *Lepidocephalus guntea* (Hamilton)
(= *Lepidocephalus annandalei*
Chaudhuri is young of this species)
65. *Noemacheilus beavani* (Günther)
66. *Noemacheilus botia* (Hamilton)
67. *Noemacheilus corica* (Hamilton)
68. *Noemacheilus devdevi* Hora
69. *Noemacheilus multifasciatus* Day
70. *Noemacheilus inglisi* Hora
71. *Noemacheilus savona* (Hamilton)
72. *Noemacheilus scaturigina* (McClelland)
73. *Noemacheilus shebbeari* Hora

74. *Somileptes gongota* (Hamilton)

Order.—Siluriformes

Family.—Siluridae

75. *Ompok bimaculatus* (Bloch)
76. *Silurus cochinchinensis* Valenciennes
77. *Wallago attu* (Bloch & Schneider)

Family.—Clariidae

78. *Clarias batrachus* (Linnaeus)

Family.—Heteropneustidae

79. *Heteropneustes fossilis* (Bloch)

Family.—Olyridae

80. *Olyra longicaudata* McClelland
(= *Olyra kempfi* Chaudhuri)

Family.—Chacidae

81. *Chaca chaca* (Hamilton)

Family.—Schilbeidae

82. *Eutropiichthys vacha* (Hamilton)
83. *Eutropiichthys murius* (Hamilton)
84. *Pangasius pangasius* (Hamilton)
85. *Clupisoma garua* (Hamilton)
86. *Silonia silondia* (Hamilton)

Family.—Bagridae

87. *Batasio batasio* (Hamilton)
- *88. *Batasio tengana* (Hamilton)
89. *Rama rama* (Hamilton)
90. *Mystus bleekeri* (Day)
91. *Mystus cavasius* (Hamilton)
92. *Mystus menoda* (Hamilton)
93. *Mystus seenghala* (Sykes)
94. *Mystus vittatus* (Bloch)
95. *Rita rita* (Hamilton)

Family.—Amblycipitidae

96. *Amblyceps mangois* (Hamilton)

Family.—Sisoridae

97. *Bagarius bagarius* (Hamilton)
 98. *Conta conta* (Hamilton)
 (= *Erethistes alongatus* Day)
 99. *Erethistes pusillus* Muller & Troschel
 **100. *Hara hara* (Hamilton)
 **101. *Hara jerdoni* Day
 102. *Euchiloglanis hodgarti* (Hora)
 103. *Glyptothorax horai* Shaw & Shebbeare
 104. *Glyptothorax cavia* (Hamilton)
 (= *Glyptothorax lineatus* (Day))
 105. *Glyptothorax telchitta* (Hamilton)
 106. *Glyptothorax ribeiroi* (Hora)
 107. *Glyptothorax shawi* (Hora)
 **108. *Glyptothorax conirostre* (Steindachner)
 109. *Gagata viridescens* (Hamilton)
 110. *Pseudecheneis sulcatus* (McClelland)
 111. *Sisor rabdophorus* Hamilton

Super-order.—Atherinomorpha

Order.—Atheriniformes

Sub-order. Exocoetoidei

Family.—Belonidae

112. *Belone cancila* (Hamilton)

Super-order.—Acanthopterygii

Order.—Gastrosteiformes

Sub-order.—Syngnathoidei

Family.—Syngnathidae

113. *Doryichthys deocata* (Hamilton)

Order.—Channiformes

Family.—Channidae

114. *Channa barca* (Hamilton)
 (= *Ophicephalus amphibius* McClelland)
 115. *Channa orientalis*
 (Bloch & Schneider)
 116. *Channa marulius* (Hamilton)
 117. *Channa punctatus* (Bloch)

118. *Channa stewarti* (Playfair)

119. *Channa striatus* (Bloch)

Order.—Synbranchiformes

Sub-order.—Synbranchioidei

Family.—Amphipnoidae

120. *Amphipnous cuchia* (Hamilton)

Order.—Perciformes

Sub-order.—Percoidei

Family.—Centropomidae

121. *Chanda nama* Hamilton
 122. *Chanda ranga* Hamilton
 *123. *Chanda baculis* Hamilton

Family.—Sciaenidae

124. *Johnius coitor* (Hamilton)
 125. *Pama pama* (Hamilton)

Family.—Nandidae

126. *Nandus nandus* (Hamilton)

Family.—Badidae

127. *Badis badis* (Hamilton)

Sub-order.—Gobioidei

Family.—Gobiidae

128. *Glossogobius giuris* (Hamilton)

Sub-order.—Anabantoidei

Family.—Anabantidae

129. *Anabas testudineus* (Bloch)

Family.—Osphronemidae

130. *Ctenops nobilis* McClelland
 131. *Colisa chuna* (Hamilton)
 132. *Colisa fasciatus* (Bloch)

Sub-order.—Mastacembeloidei

Family.—Mastacembelidae

133. *Mastacembelus armatus* (Lacépède)

134. *Mastacembelus pancalus* (Hamilton) Sub-order.—Tetraodontoidei
 135. *Macrogathus aculeatus* (Bloch) Family.—Tetraodontidae
 Order.—Tetraodontiformes 136. *Tetraodon cutcutia* (Hamilton)

III—SYSTEMATIC NOTES

Balitora maculata Gray and Hardwicke

1832. *Balitora maculata* Gray and Hardwicke, *Ill. Indian Zool.*, **I**, pl. 88, figs. 2, 3a (Type-locality: Northern India).
 1920. *Balitora maculata*, Hora, *Rec. Indian Mus.*, **19**, p. 199, fig. 2.

Material examined.—

2 exs., Regd. No. F. 9860-61 (Cat. No. 939), Darjeeling, Dr. N. Wallich, in bad state of preservation.

Remarks.—

Day described some material from Wynaad, Bowany river (South India) under this species. Hora (1920) discovered that Day's material from South India did not belong to Gray's *maculata* and hence considered it under a new genus and species, *Bhavana annandalei* Hora. The two specimens from Darjeeling were recognised by him as the true representatives of *Balitora maculata* Gray and Hardwicke which he redescribed (Hora, 1920). The diagnostic features of this species, as can be discerned from the material under study, Hora's description and Gray's figures, are as follows:

The mouth is subterminal and inferior. The head is depressed, short and broad. The snout is more or less semicircular. There are six short and conical barbels. The upper lip is tentaculate. The chest and belly are scaleless. The pectoral fins are pedunculate, greatly expanded and with 11 rays of which 9 are unbranched. The pectoral fin reaches beyond the ventrals and the caudal lobes are equal (missing in the present material).

Distribution.—

Eastern Himalaya.

Glyptothorax conirostre (Steindachner)

1867. *Glyptosternum conirostre* Steindachner, *Sitzungsk. R. Acad. Wiss. Wien*, **55**, (1), p. 532, pl. 5, fig. 2 (Type-locality: Simla).
 1954. *Glyptothorax conirostre*, Menon, *Rec. Indian Mus.*, **52**, p. 36.

Material examined.—

1 ex. (95 mm. S.L.), Regd. No. F. 11378/1, Mahanadi river at Siliguri, below Darjeeling, West Bengal, G.E. Shaw and E.O. Shebbeare.

Remarks.—

The skin is smooth. The adhesive thoracic apparatus on the chest is longer than broad. The supraoccipital process of head does not touch the basal bone of the dorsal fin. The dorsal spine is weak and smooth. The origin of the dorsal fin is equidistant from tip of the snout and the origin of the adipose dorsal.

Distribution.—

Simla and Darjeeling (West Bengal).

Hara hara (Hamilton)

1822. *Pimelodus hara* Hamilton, *Gangetic Fishes*, pp. 190, 378 (Type-locality: Kosi river).

1949. *Hara hara*, Hora, *Rec. Indian Mus.*, **47**, p. 200.

Material examined.—

1 ex. (62 mm. S.L.), Regd. No. F. 11390/1, Terai and Duars, North Bengal, G.E. Shaw and E.O. Shebbeare.

Remarks.—

The pectoral spine is indented on both edges. The indentations on the outer side point away from the base while those on the inner side point towards the base. The anterior side of the dorsal spine is smooth while the posterior is serrated. The humeral process is long and extends opposite 1/3rd of the dorsal fin and the last lateral tubercle. The body is finely granulated.

Distribution.—

Uttar Pradesh, Bengal, Orissa, Assam and Burma.

Hara jerdoni (Day)

1870. *Erethisets jerdoni* Day *J. Asiat. Soc. Bengal*, **39**, p. 37 (Type-locality: Sylhet).

1949. *Hara jerdoni*, Hora, *Rec. Indian Mus.*, **47**, p. 202.

Material examined.—

1 ex. (22 mm. S.L.), Regd. No. F. 318/2, Tista river, Jalpaiguri, West Bengal, N. Annandale and S.W. Kemp, 3.6.1911.

Remarks.—

The pectoral spine is indented on both the edges. The indentations on the outer side point away from the base and those on the inner border point towards the base. The length of the pectoral spine is nearly 1.5 times that of the length of the head. The humeral processes extend along the edges of the abdomen. The head and body are stumpy and wide.

Distribution.—

Bihar, West Bengal and Assam.

IV—SUMMARY

Out of 131 species of fishes of North Bengal, described by Shaw and Shebbeare (1938), two have been synonymised with other species and with the addition of three species by Hora and Gupta (1941) and four in this paper, the number of species of North Bengal has grown to 136. The names of the species have been revised up-to-date and the list is arranged according to the recent classification of Greenwood *et al.* (1966). Systematic notes on four species, added to the list in this paper, have been given here.

V—ACKNOWLEDGEMENTS

The author feels grateful to Dr. A.P. Kapur, Director, Zoological Survey of India, Calcutta for grant of facilities and sustained encouragement. He is also thankful to the Secretary, Darjeeling Natural History Museum, Darjeeling for putting the collection of fishes of North Bengal at his disposal for study and identification.

VI—REFERENCES

- Day, F. 1877. *The Fishes of India; being a natural history of the fishes known to inhabit the seas and freshwaters of India, Burma and Ceylon.*—London, xx—778 pp., 198 pls.
- Greenwood, P.H. , Rosen, D.E., Weitzman, S.H. and Myers, G.S. 1966. Phyletic studies of Teleostean Fishes, with a provisional classification of living forms. *Bull. Amer. Mus. Nat. Hist.*, N.Y., **131**, (4), 339-456.
- Hora, S.L. 1920. XXIII. Revision of the Indian Homalopteridae and of the genus *Psilorhynchus* (Cyprinidae). *Rec. Indian Mus.*, **19**, 195-216, pls. 10-11.
- Shaw, G.E. and Shebbeare, E.O. 1938. The Fishes of North Bengal. *J. roy. Asiat. Soc. Bengal (Sc.)*, **3**(1), 1-137, 130 text-figs., 6 pls.
-

A Dwindling Population of Swamp Deer, *Cervus duvauceli branderi* Pocock (Family: Cervidae: Mammalia)*

N.K. SINHA

Zoological Survey of India, 27 Chowringhee Road, Calcutta-13

The swamp deer, locally known as Gond or Barasingha, inhabits swampy areas in the foot hills (Terai) along the Himalayas right from western Uttar Pradesh to the extreme eastern part of India and another population of the same species occurs in of Madhya Pradesh, the ecology of which part is different from that of the foothills of Himalayas where the swamp is a permanent feature. In the latter there is hard ground with very few patches of swamps in the monsoon months (between June to October).

On the basis of this geographical distribution of the population in two different ecological areas, Ellerman and Morrison-Scott, (1951) recognise two sub-species of this deer. he nominate sub-species, *Cervus duvauceli duvauceli* Cuvier, occurs in sal forests of Uttar Pradesh (Terai) along the foot-hills of Himalayas and Assam and other sub-species *Cervus duvauceli branderi* (Pocock), is restricted to the open hard ground of Madhya Pradesh.

Clutton-Brook, 1965 has reported its distribution, on the basis of fossil records, throughout the basin of Indus, the Ganges and the Brahmaputra, ranging upto Godavari river in the south and Gujarat in the west. Upto nineteenth century the swamp deer was occurring throughout the base of Himalaya, from Rohri in upper Sind to Indo-Gangetic Plains and the areas between Ganges and Godavari rivers in the south and eastwardly upto Assam (Bhadian, 1934; Blanford, 1888-91; Brander, 1923; Finn, 1929; Gee, 1964; Jerdon, 1874). Presently they are found only in the sub-montane tracts of eastern Uttar Pradesh from little east of Bareilly to Assam, where still they are plentiful. They are also said to exist in the valley of Brahmaputra river (Stockley, 1951) and have completely disappeared from western and southern part of its range (Burton, 1952).

As regards the distribution of the swamp deer in the hard ground of Madhya Pradesh, Stockley (1951) remarked, "It seems probable that thousands of years ago the Central Province contained large tracts of swampy country, as the great Indian Peninsula was forced up when pressure created the Himalayas, where I have collected many marine fossils at from 15,000—17,000 feet. The marshes at the foot of the hills continue to be fed by mountain streams, while peninsular India is slowly drying off."

The population of *Curvus duvauceli brandelri* (Pocock) is fast decreasing and its continuous existence in the wild state is doubtful unless some drastic steps are taken for the management. To investigate the means of conservation, the ecology and habits with special reference to the limiting factors of swamp deer and other artiodactyles, the author visited the Kanha National Park, Mandla district (M.P.) in May-July 1970 and again revisited the area and stayed there continuously from March, 1971 to March, 1972.

Curvus duvauceli branderi (Pocock)

This deer second largest among the deer after the sambar, resembles the red deer in size and appearance. It is a large and graceful deer. Its size as given by different authors ranges from 117 to 137 cm. at its shoulder (Blandford, 1888-91; Brander, 1923; Dharmakumarsingji, 1959; Jerdon, 1874; Prater, 1948; Schaller, 1967; Stockley, 1951). It has large spreading ears as in sambar.

Colour: The molting of coat begins in March and by mid-May all animals are in their summer coat. The colour of coat in summer months is chestnut brown or dull reddish brown on the back, the sides and belly are lighter reddish brown, creamy white colour of the rump, inside of the tail and legs. The chin, throat and inside of the ear are whitish. Throughout the length of the vertebral column a dark brown band runs, bordered by white spots, evident in few individuals. Soon on the onset of monsoon, the colour of body coat changes to very bright reddish brown or bright chestnut brown with a dark brown line, bordered by white spots on the back and sides. This change in colour is very swift. From the beginning of September, the monsoon coat starts getting dark and this darkness in the coat spreads up from the dark line of the back. The darkness of the coat increases with the cold and by November, all the animals are very dark. The stags are darker than the hinds and fawns. The body hair also grow much longer than in summer or monsoon coat.

Antlers: The antlers of the adult stag are very characteristic of the species and even the two sub-species of *Cervus duvauceli* differ from each other in the antlers' shape. In the subspecies *C. d. branderi* it is less white and rough and the brow tine is set at right angles to the main beam, which grow with an outward curve giving the antlers a wider spread. At this point, where it branches, the beam takes an almost horizontal curve and gives off a number of vigorous vertical tines, each of which is further branched. Generally tines are 6 to 14 in number as also reported by Schaller (1967), although there may be as many as 20 (Prater, 1948). The average length of antler is about 76 cm. (Dharmakumarsinghi, 1959; Finn, 1929) but the record length is 104 cm. (Ward, 1922). Pocock (1912) illustrating five stages of growth in the swamp deer antler.

The first indication of the antler is a small bump on the frontal bone, which appears at about seven months of age in the fawn. This spike is not shed at the time of shedding the antlers in April-May in the first year.

Curvus duvauceli branderi differs from the nominate sub-species; *C. d. duvauceli* of northern India in the following characteristics. It has hard and well knitted hoofs suitable for galloping on hard ground, dark horns and a generally darker pelage. These differences are correlated with very different habitat where there are practically no swamp in the sense that they occur in Terai of northern India and Assam (Table 1).

According to the forest department of Madhya Pradesh (Nath, MSS), the past distribution of this sub-species was primarily in the sal forests, south of the Narbada river in the Banjar and Jagmandal reserves and in Amarkantak, Bilaspur, Raipur, Balaghat and Bastar districts and parts of Bhandara and South Chanda districts. In many of these areas, the swamp deer occurred even in mixed forests, which are generally situated in more arid areas in comparison to sal forests. The swamp deer had a range upto Pachmarhi, about 480 km. west of Kanha. At present this swamp deer is entirely confined to the Kanha National Park.

Table 1

Ecological conditions in the habitat of the two subspecies of the swamp deer

Sl. No.	Ecological factors	<i>C.d. duvauceli</i>	<i>C.d. branderi</i>
1	Topography	Flat to undulating	Undulating and hilly
2	Altitude	ca 120 to 200 mts.	ca 600 to 900 mts.
3	Temperature	Light frost to 43.5°C	-02°C to 41°C
4	Rainfall	1650 to 1850 mm.	1825 mm.
5	Vegetation	Mainly marshy reed beds	Meadows in sal forest with moderately high grass in rainy season
6	Monsoon	May to early October (Assam), July to October (Kheri)	Middle of June to middle of October
7	Water supply	No scarcity	Scanty from April to middle of June
8	Winter	From November to February	From November to March

Table

Total number of male, female and fawn and their percentage in the swamp deer population

Years	1965				1966				1967			
	Population	Male	Female	Fawn	Population	Male	Female	Fawn	Population	Male	Female	Fawn
Number	109	26	69	14	116	29	69	18	181	47	112	22
Percentage in the total population	—	23.9	63.3	12.8	—	25.0	59.5	15.5	—	26.0	69.1	12.2
Percentage of fawn in relation to the female population	—	—	—	20.3	—	—	—	26.9	—	—	—	19.6

2

in the Kanha National Park from 1965 to 1971 (Courtsey Forest Department)

1968				1969				1970				1971			
Population	Male	Female	Fawn	Population	Male	Female	Fawn	Population	Male	Female	Fawn	Population	Male	Female	Fawn
98	19	56	23	70	16	34	20	66	13	46	7	88	26	43	19
—	18.4	57.1	23.5	—	22.9	48.6	28.6	—	19.7	69.7	10.6	—	29.5	48.9	21.6
—	—	—	41.7	—	—	—	58.8	—	—	—	15.2	—	—	—	44.2

According to Rudman (Mandla District Gazetteer, 1912), the swamp deer was one of the commonest, their primary haunt being Banjar reserve (now Kanha National Park) where they were in thousands; the other lesser important haunts being Motinala and north and south Phen reserves.

Since 1938, the swamp deer population is on steady decline in whole of its habitat in Madhya Pradesh, so much so that present day it is surviving only in the Kanha National Park. In that year the estimation of its population in the Kanha National Park was 3023 individuals. The estimation of swamp deer population was carried out almost regularly every year since 1953. The census method before the year 1953 is not known but from that year the method used is scientific (Fig. 1).

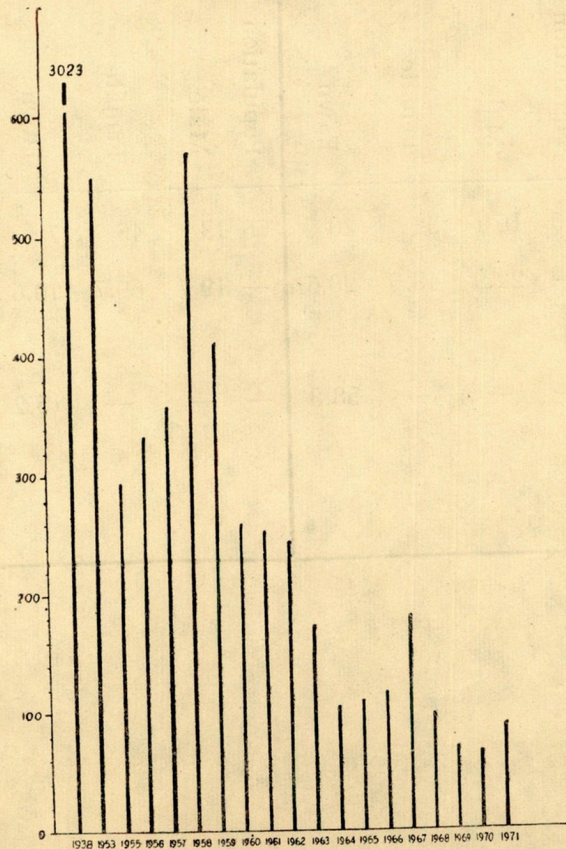


Fig 1. Census figure of swamp deer in the Kanha National Park, 1938-1971 (Curtsey: Forest Department, M.P.)

The tendency of swamp deer to assemble in the meadows makes it easy to count them. Rudman (1912) has mentioned its abundance in the various pockets of the Park. During the course of study in the Kanha National Park, a search in almost all the possible areas mentioned were made but they were found only in the Kanha National Park.

The forest departments figures of 88 swamp deer in the Kanha National Park during the annual wildlife census of 1971 was very close to the estimation of population made during the course of study, which is about 82. Due to very small population the determination of age and sex ratio is not difficult. Out of 88 individuals counted in June, 1971 by the forest department, males are about 29%, females about 49% and the fawns about 22%. Percentage of fawn appear to vary from year to year for unknown reasons. For instance in 1964 it was reported to be only 7% (Schaller, 1967) while in 1971, it was 22%. This point is investigated during the course of study and the report is being published elsewhere. The percentage of the stags, the hinds and the fawns from the year 1965 to 1971 are given in Table 2.

The age of the hind when it experiences its first parturition is about four years. Only one fawn is born at a time. Only about 50% hinds were found to be pregnant during the course of investigation in 1970-1972. The cause of low percentage of fawn production is being published separately.

POSSIBLE LIMITING FACTORS

The author studied in detail the limiting factors in the population of swamp deer during his studies in the Kanha National Park between 1970-1972. There is a chain of correlating factors which are responsible directly and indirectly for the limiting of the swamp deer population. Important among them are general appearance of aridity in the Indian sub-continent, cultivation of natural habitat, lack of sufficient cover, particularly for the young, water and food shortage during pinch period etc. The detailed report on the limiting factors of swamp deer will be published separately.

ACKNOWLEDGEMENT

The author wishes to express his sincere thanks to Dr. A.P. Kapur, Director, Zoological Survey of India, Calcutta for his guidance, valuable suggestions and interest in the present investigations.

REFERENCES

- Bhadian, C. 1934. Notes on the swamp deer (*Rucervus duvaucelli*) in Assam.—*J. Bombay nat. Hist. Soc.*, 37(2), pp. 485-486.
- Blanford, W. 1888-91. *The Fauna of British India: Mammalia*.—London.
- Brander, A. 1923. *Wild Animals in Central India*.—London.

- Burton, R. 1952. A history of shikar in India.—*J. Bombay nat. Hist. Soc.*, 50(4), pp.845-869.
- Clutton-Brock, J. 1965. Excavations at Langhnaj : 1944-63. Part II: The fauna.—
Deccan College Building Centenary and Silver Jubilee Series No. 27-Poona.
- Ellerman, J. and Morrison Scott, T. 1951. *Checklist of Palaearctic and Indian Mammals, 1758-1846.*—British Museum.—London.
- Finn, F. 1929. *Sterndale's Mammalia of India.*—Calcutta.
- Gee, E.P. 1964. *The Wild Life of India.*—London.
- Jerdon, T. 1874. *The Mammals of India.*—London.
- Nath, B. MSS. Management Plan Kanha National Park.
- Prater, S.H. 1934. *The Wild Animals of the Indian Empire.*—Madras.
———1948. *The Book of Indian Animals.*—Bombay.
- Rudman, F.R.R. 1912. *Central Provinces District Gazetteers Mandla District.*—Bombay.
- Schaller, G.B. 1267. *The Deer and the Tiger.*—Chicago.
- Stockley, C.H. 1951. Swamp deer. *Zoo Life*, 6, pp. 29-31.
- Ward, R. 1922. *Records of Big Game.*—London.
-

Further Notes on Opening of Eyes of Some Wild Carnivores in Captivity

By

L.N. ACHARJYO¹ AND R. MISRA²

It is generally believed that most of the Carnivores are born with their eyes closed and open their eyes several days after birth. Though a number of species of wild carnivores are generally maintained and bred in most of the Zoological Parks, information available on this subject specially from this country is meagre. Earlier Acharjyo (1970), Acharjyo and Tripathy (1971) and Acharjyo and Misra (1972) have reported on the opening of eyes of a few species of new-born wild carnivores of Nandankanan Biological Park, Orissa. In this paper an attempt is made to place on record our further observations on the age at which the eyes of six species of new-born wild carnivores open. The observations were made at the same Nandankanan Biological Park and the period of observations are given in each case. The reports of earlier workers have been cited and discussed.

OBSERVATIONS AND DISCUSSION

1. Tiger (*Panthera tigris*)

Both the eyes of all the nine tiger cubs born in this park during the period from 1.7.1971 to 30.9.1973 were closed at birth and the details of opening of their eyes are given in Table I.

The cats at birth are usually blind and helpless (Prater, 1971; Walker *et al.*; 1964). Chaturvedi (1970) states that the cubs are able to open their eyes nine days after birth. The tiger cubs open their eyes in fifteen to sixteen days (Denis, 1964). Crandall (1965) reported that the eyes of three cubs of New York Zoological Park were closed at birth and opened on 9th day (female), 11th day (male) and 17th day (male) respectively. The tiger cubs are born blind and they open their eyes in seven to eleven days (Acharjyo and Misra, *loc. cit.*).

2. African Lion (*Panthera leo*)

Both the eyes of all the seven African Lion cubs born here during the period from 1-7-1971 to 30-9-1973 were closed at birth and the details of the opening of their eyes are given in Table II.

1. Veterinary Assitant Surgeon, Nandankanan Biological Park, Post: Barang, District: Cuttack.
2. Wild Life Conservation Officer, Orissa, Old Secretariate Building, Cuttack-1.

Table I
Details of opening of eyes of tiger cubs

Sl. No.	Sex of the cubs	Date of birth	Date of opening of the eyes	Age in days when the eyes of the cubs opened	Remarks
1	2	3	4	5	6
1	Female	7-11-1971	14-11-1971	8th day	
2	Female	2-4-1972	13-4-1972	12th day	
3	Female	2-4-1972	15-4-1972	14th day	
4	Male	2-4-1972	12-4-1972	11th day	
5	Female	14-12-1972	22-12-1972	9th day	
6	Female	14-12-1972	21-12-1972	8th day	
7	Female	14-12-1972	21-12-1972	8th day	
8	Male	22-6-1973	30-6-1973	9th day	
9	Female	22-6-1973	29-6-1973	8th day	

Table II
Details of opening of eyes of African Lion cubs

Sl. No.	Sex of the cubs	Date of birth	Date of opening of the eyes	Age in days when the eyes of the cubs opened	Remarks
1	2	3	4	5	6
1	Female	20-10-1971	28-10-1971	9th day	
2	Male	20-10-1971	28-10-1971	9th day	
3	Male	20-10-1971	28-10-1971	9th day	
4	Male	30-10-1972	14-11-1972	16th day	
5	Female	30-10-1972	11-11-1972	13th day	
6	Male	17-9-1973	25-9-1973	9th day	
7	Male	17-9-1973	26-9-1973	10th day	

The cats at birth are usually blind and helpless (Walker *et al.*; *loc. cit.*). Beasts of prey are usually born blind and helpless but some baby lions can see at birth (Prater, *loc. cit.*). According to Denis (*loc. cit.*) the lion cubs are born with their eyes open or closed. The lion cubs are born with their eyes fully open (Lydekker, 1893-96). Crandall (*loc. cit.*) states that full opening of eyes of lion cubs at birth may happen occasionally but all of the many new-born lion cubs he had seen, had their eyes closed at birth and each of the two female lion cubs born at New York Zoological Park opened one of their eyes on the fifth day and the other eye on the next day. Acharjyo (*loc. cit.*) reported that both the eyes of all the four African lion cubs were closed at birth and opened on 11th day (2 female cubs) and 13th day (2 male cubs). The African lion cubs are born with their eyes closed and they open their eyes in thirteen to fourteen days (Acharjyo and Misra, *loc. cit.*).

3. Leopard or Panther (*Panthera pardus*)

The eyes of all the fifteen leopard cubs including one still-born cub born here during the period from 1-7-1971 to 30-9-1973 were closed at birth and the details of opening of the eyes of thirteen cubs only are given in Table III (See Page 52).

The cats at birth are usually blind and helpless (Prater, *loc. cit.*; Walker *et al.*, *loc. cit.*). The eyes of a male black leopard cub of New York Zoological Park opened on the sixth day (Martini, 1955). The panther cubs are born blind and they generally open their eyes in about three to four weeks (Chaturvedi, 1969). Acharjyo (*loc. cit.*) reported that both the eyes of all the six cubs born upto 30-6-1969 at Nandankanan Biological Park were closed at birth and opened on 11th day (2 female cubs), 13th day (2 male cubs) and 15th day (1 male cub). According to Acharjyo and Misra (*loc. cit.*) the leopard cubs are blind at birth and they open their eyes in eight to fifteen days.

4. Jungle cat (*Felis chaus*)

The eyes of all the eleven jungle cat kittens born here during the period from 1-7-1971 to 30-9-1973 were closed at birth and the details of opening of eyes of two kittens only are given in Table IV (See Page 53).

The cats at birth are usually blind and helpless (Prater, *loc. cit.*; Walker *et al.* *loc. cit.*).

5. Common palm civet or Toddy cat (*Paradoxurus hermaphroditus*)

Both the eyes of all the sixteen young born here during the period from 15-4-1971 to 30-9-1973 were closed at birth and the details of opening of eyes of thirteen young only are given in Table V (See Page 53).

Table III
Details of opening of eyes of leopard cubs

Sl. No.	Sex of the cubs	Date of birth	Date of opening of the eyes	Age in days when the eyes of the cubs opened	Remarks
1	2	3	4	5	6
1	Male	3-8-1971	10-8-1971	8th day	
2	Male	3-8-1971	11-8-1971 (Right eye) and 12-8-1971 (left eye)	Right eye on 9th day and left eye on 10th day	
3	Female	22-4-1972	5-5-1972	14th day	
4	Male	18-6-1972	26-6-1972	9th day	
5	Male	18-6-1972	28-6-1972	11th day	
6	Female	20-1-1973	30-1-1973 (Right eye) and 31-1-1973 (left eye)	11th day (Right eye) and 12th day (left eye)	
7	Female	20-1-1973	28-1-1973 (Right eye) and 29-1-1973 (left eye)	9th day (Right eye) and 10th day (left eye)	
8	Female	23-7-1973	3-8-1973	12th day	
9	Male	23-7-1973	31-7-1973 (Right eye) and 1-8-1973 (left eye)	9th day (Right eye) and 10th day (left eye)	
10	Male	23-7-1973	2-8-1973	11th day	
11	Female	2-8-1973	9-8-1973	8th day	Black coloured panther cub Black coloured panther cub
12	Male	2-8-1973	10-8-1973	9th day	
13	Male	2-8-1973	11-8-1973	10th day	

Table IV

Details of opening of eyes of Jungle cat kittens

Sl. No.	Sex of the kittens	Date of birth	Date of opening of the eyes	Age in days when the eyes of the cubs opened	Remarks
1	2	3	4	5	6
1	Female	17-1-1973	27-1-1973	11th day	
2	Male	17-1-1973	27-1-1973	11th day	

Table V

Details of opening of eyes of Common palm civet young

Sl. No.	Sex of the young	Date of birth	Date of opening of the eyes	Age in days when the eyes of the young opened	Remarks
1	2	3	4	5	6
1	Female	24-4-1971	29-4-1971	6th day	
2	Male	24-4-1971	29-4-1971	6th day	
3	Male	7-5-1972	12-5-1972	6th day	
4	Male	7-5-1972	12-5-1972	6th day	
5	Female	7-5-1972	12-5-1972	6th day	
6	Female	7-5-1972	12-5-1972	6th day	
7	Female	18-5-1972	27-5-1972	10th day	
8	Male	8-4-1973	16-4-1973	9th day	
9	Male	8-4-1973	17-4-1973	10th day	
10	Female	4-5-1973	9-5-1973	6th day	
11	Female	4-5-1973	11-5-1973	8th day	
12	Male	4-5-1973	10-5-1973	7th day	
13	Male	4-5-1973	10-5-1973	7th day	

Both the eyes of three young born at Nandankanan Zoo (Orissa) on 3-4-1971 were closed at birth and the eyes of one young opened on the tenth day (Acharjyo and Tripathy, 1971). The viverrids are born blind (Walker *et al.*, *loc. cit.*).

6. Common Mongoose (*Herpestes edwardsi*)

The eyes of two young including one still-born young born here in one litter on 24-5-1971 were closed at birth and the details of opening of eyes of one young is given in Table VI.

Table VI
Details of opening of eyes of Common Mongoose

Sl. No.	Sex of the young	Date of birth	Date of opening of the eyes	Age in days when the eyes of the young opened	Remarks
1	2	3	4	5	6
1	Male	24-5-1971	9-6-1971	17th day	

The eyes of a common mongoose were closed at birth and opened on the 18th day (Acharjyo, *loc. cit.*).

Summary

In this note an attempt is made to present further information on the opening of eyes of six species of Wild carnivores observed at Nandankanan Biological Park, Orissa.

It is observed that the tiger cubs opened their eyes in eight to fourteen days, African lion cubs open their eyes in nine to sixteen days, leopard cubs open their eyes in eight to fourteen days, jungle cat kittens open their eyes in eleven days, common palm civet young open their eyes in six to ten days and the common mongoose open their eyes in seventeen days.

Acknowledgement

The authors are grateful to Shri D.N. Choudhury, I.F.S., Chief Conservator of Forests, Orissa and Shri S.N. Das, I.F.S., Conservator of Forests, Development Circle, Cuttack for the facilities provided.

References

1. Acharjyo, L.N. (1970)—Indian Journal of Animal Health, IX (2); 125-129.
 2.& Tripathy, A.P. (1971)—A note on body colour and breeding habits in captivity of common palm civet (*Paradoxurus hermaphroditus*) of Orissa. J. Bombay nat. Hist. Soc. (Accepted for publication).
 3.& Misra, R. (1972)—Indian Forester, 98 (2), PP. 132-134.
 4. Chaturvedi, M.D. (1969)—The Panther on the Prowl, National Book Trust, New Delhi, India, PP. 70.
 5.(1970)—The Felines, National Book Trust, New Delhi, India, PP. 26.
 6. Crandall, Lee S. (1965)—The management of Wild Mammals in captivity. The University of Chicago Press, Chicago and London, PP. 348-413.
 7. Denis, Armand (1964) —Cats of the World, Constable & Co. Ltd., London WC 2, PP. 26-62.
 8. Lydekker, Richard (1893-96)—Cited by Crandall, Lee S. (1965).
 9. Martini, Helen (1955)—.....
 10. Parter, S.H. (1971)—The Book of Indian Animals, 3rd Revised Edition, Bombay Natural History Society, Bombay, PP. 63-102.
 11. Walker, Ernest P. *et al.* (1964)—Mammals of the World, Vol. II, The Jons Hopkins Press, Baltimore, PP. 1224-79.
-

The Spotted Terror

By

LT. COL. A.A. DAVID

This is the story of a leopard who became a man-eater by accident.

Nasirabad is a very old cantonment, coming down from days, even earlier than the Sepoy mutiny. Kipling too has mentioned it, in his tour notes, while travelling from Ajmer to Deoli, in a tonga. It lies fourteen miles from Ajmer, on the Ajmer-Khandwa main line. In pre-independence days, it always had a British battalion, a compliment of artillery and supporting troops, stationed there. The National Highway No. 8, from Delhi to Bombay, also connects Ajmer to Nasirabad and part of it passes through high Aravali ranges, forming a ghat portion, about four miles in length. These ranges were and still are, to some extent, covered with thick scrabby jungle and during monsoon, look beautiful and verdent. This area, used to be the residence of a couple of pairs of leopards and in pre-world war I days, if one crossed the ghats at night, he or she was sure to see one or two of them, either sitting on the road or gliding across it, in the beam of the car light. The looked quite inoffensive.

Now those days, as has already been mentioned, most of the troops stationed at Nasirabad, were British and their staple food was beef. At that time, sentiments against cow slaughter, were not so strong as they are now and so to cater for their needs cows were regularly slaughtered every day. Ajmer too had a fair sized population of Anglo-Indians, mostly railway employees, besides the British civilian officials and muslims. To meet their demands, every morning, very early, a beef wagon, drawn by bullocks, left Nasirabad for Ajmer. It usually crossed the ghat area, while it was still dark, to be in time for the market in Ajmer. The smell of raw meat and blood, naturally attracted the wild animals of the area, like jackals, hyenas and even leopards and it was not an uncommon sight for the bullock cartwalah, Abdullah, to see these animals following the cart along the ghat gradient.

Eventually the animals became bolder and apart from a pair of heyenas, which followed the cart all along, a pair of leopards made it their habit to sit on the rocks, midway and extract their share of the toll. They became so bold gradually, that they would not allow the cart to pass unless a chunk of meat was thrown to them. This became a regular habit, so much so that, Abdullah started bringing an extra piece of meat for them. Only when this was thrown, they allowed the cart to pass, otherwise they growled and demonstrated angrily in front and on the sides.

Things went on like this and nobody bothered about them. Abdullah treated it as fun. Then came world war II during which there was a great influx of troops into Nasirabad and after the war came independence and partition. British troops left for

England and the muslim troops and the muslim population of Ajmer also went away to Pakistan and Nasirabad was occupied by Indian troops. Cow being a sacred animal, its slaughter was immediately stopped but the leopards continued to sit, waiting for the beef wagon which came no more. Since they had developed the habit of being spoon-fed, they were reluctant to go for their natural game.

One March morning, when it was getting warmer, a villager left his home near the township of Bir, rather early with Karwi (dried millet stalks for cattle feed) for Ajmer. As he was negotiating the ghats, the leopards growled, demonstrated or probably pounced on the cart, taking it to be the beef wagon. The bullocks panicked and ran headlong into the khud. They were later discovered lying there still hitched to the cart though badly crippled but there was no trace of the cart-walah. His body was however, found about half a mile from the scene, lying under a bush, partially eaten. So the leopard had killed a man by accident and became a man-eater. He must have discovered how easy it was to kill a man.

His next victim was a Roman catholic priest, returning from his rounds of the villages, on his bicycle. He was waylaid on a lonely part of the gahts but the priest was a huge, powerful man and so fought with the leopard, blow for blow. He was rescued by a passing car and was brought to Ajmer, where he succumbed to his injuries in the hospital, the next day. According to him, the leopard was a small mangy animal.

After this the leopard remained on the rampage and not very long after, his tally of human victims reached ten, mostly innocent villagers. Help was sought from the authorities and also from shikaries in Ajmer and Nasirabad, but very little happened and the leopard continued to do its stray killings. By now it had developed the stealth and cunning of a man-eater and therefore easily evaded all attempts to get at it. Some of the shikaries were supposed to have had a shot at it and missed it from a point blank range. How far that was true was not known but it gave the leopard an aura of having a charmed life and since ignorance and superstition was rampant in this part of the country, it soon became a shaitan or evil spirit. Traffic, after dark on the National Highway almost came to stand-still and travellers were warned not to go alone in the ghat area.

Panic and scare soon spread in the countryside and people were afraid to leave their homes at night. Even visits to neighbouring villages were only attempted when it was absolutely necessary. Along the National Highway, in the ghat area, on the Ajmer side, a small seasonal nalah runs for quite a distance. It flows only during the rains but has quite a lot of sub-soil water, which oozes out and forms pools and puddles, of various sizes at few places. On the edges of these pools and puddles grow groves of date palms, which look very picturesque, shady and inviting during summer months. To these pools and puddles many birds and animals, including the village cattle, come for drinking water.

Hatundi is a biggish village, midway between Ajmer and Nasirabad. It has about three hundred houses and a population of a thousand. Ramu was a small boy of thirteen

and lived in Hatundi. His parents were poor farmers and had a small plot of land which they cultivated for their living, adjacent to the village. He had two sisters and a brother, all younger to him. Besides the plot of land, they had half a dozen starving cattle, for whom Ramu was responsible for taking out and feeding and watering. Invariably, he left, with them, fairly early in the morning, and after roaming throughout the day, returned home by about four in the afternoon. He usually went with other village boys who took their own cattle.

One day in middle of May, he went out with the cattle as usual. Round about ten, he left them to graze and feed on whatever they could lay their mouths on and finding the sun too strong, he decided to take shelter in one of the date palm grove. He had hardly settled down when the wily leopard, which was lurking nearby, attacked him. His agonising cries brought other boys to his rescue but the leopard had already done the damage. Catching him by the throat, it had killed him but hearing the noise of his friends, and seeing them coming, it had left Ramu and ran away. Very soon the news spread and the whole village turned up.

The commissioner of the district was an Englishman. He was an ex-soldier and a keen shikari. He had already shot a dozen tigers and had issued an order to all his subordinates, down to the level of patwaries and constables, that if there was any human kill, the remains, under no circumstances were to be removed but to be kept as they were. But it was easier said than done. The moment the death of Ramu reached his parents, they came running and started howling and lamenting and wailing, in which the villagers also joined. They demanded and insisted that they be allowed to take the body of the boy to give him a proper funeral and it was a job for the poor patwari to persuade them to let the remains stay where they were as the commissioner sahib was coming to see them. After a lot of argument, they eventually agreed to allow the commissioner sahib to have look at them on condition that after that, they would be allowed to take him away. Immediately on hearing that the leopard had killed Ramu, the alert patwari, had already despatched a man on cycle to the katcheri, to inform the commissioner, as were his orders. Now read what the commissioner had to say.

The information, about the boy Ramu, reached me at about twelve in the afternoon but having some important cases to attend, I could not leave the court, before 2.30 p.m. Then I went home and had a quick lunch. Changed into my shooting gear and collecting my weapon, drove straight to Hatundi. When I reached the spot of the incident, I found a sizeable crowd gathered there, about two hundred strong. The girdhawar and the patwari met me and told me the position. So I asked them to bring the parents of the boy to me. They came and let go a tremendous wail. When it subsided, I explained to them the importance of getting rid of the leopard or the evil one as they called it and sought their cooperation in it. If they did not and insisted on taking away Ramu's remains, then

the leopard would surely kill some more innocent people? They were willing to help but thought that it was against the Sahstras if the boy did not get a proper funeral. I pleaded with them and assured them that I would protect the body and see that no harm came to it and that they could come and take it in the morning. They very reluctantly, eventually, agreed.

After that I asked the girdhawar and the patwari to see that the crowd dispersed as soon as possible because their continuous presence there and the noise they were making, was, enough to scare any animal, leave alone a cunning man-eater. I was afraid that the damage had already been done and doubted if the animal would return to the kill. By the time this was done and the crowd finally dispersed, it was 4.30 p.m. and I had a lot to do before I settled down for the night. With the girdhawar and the patwari I went to the road look for a suitable spot to sit. There was a stunted Bir tree jutting out of the embankment of the road. Its aerial roots hung loose and some of them almost touched the nalah bed. One of its branches, a fairly thick one, projected almost twenty feet into the nalah. Though not in line with the body of Ramu, it was at slight angle to it. It appeared fairly suitable for my purpose and I decided to sit on it.

About 5.30 p.m. I sent the girdhawar and the patwari back home with the instructions that they were only to come the next morning. Then I climbed the tree and sat on my perch on the Bir tree and settled down for the long wait. It did not turn out to be as suitable as it looked. Firstly it had no back rest nor had enough leg space to stretch out. Secondly, its level almost flushed with the road level. This was a very serious disadvantage and dangerous one too. I could easily be attacked from behind by the animal, while concentrating in front. But it was then too late to do anything about it. So I resigned myself to my fate and do my best under the circumstances. The remains of the boy were about thirty yards from me and I could see them clearly. The exposed portions of the body looked, darker as they were covered with a swarms of flies.

There was still one and half hour for the light to go. So to pass the time, I watched the traffic on the road go by. It was mostly vehicular with only a few pedestrians. Soon it became boring. Though I was pretty certain that the wily animal would not turn up during the daylight hours, but one couldn't be too sure where a man-eating leopard was concerned. It always did the unpredictable. Therefore I did not slacken my vigilance, just in case.

Slowly the minutes ticked away and faint darkness descended on the hills. It was not sudden but gradual. Simultaneously, the traffic on the road also petered off and became sporadic. I took out the packet of sandwiches and my thermos flask, filled with hot coffee, and had a leisurely meal. This was a ritual I had to do at one time or other and though I wasn't feeling at all hungry, I decided to go through it before it got dark. The heat became intense and it turned close, stuffy and uncomfortable. I soon got soaked in perspiration and some of it trickled down my cheeks and throat, making it messy and unpleasant.

By about 7.30 p.m. the traffic on the road practically stopped and except for a stray car or a truck, there was hardly any movement. With the arrival of darkness, the visibility diminished so much so that poor Ramu's remains now looked faint and indistinct. I had brought my 12 bore with an attachment for a powerful torch and I loaded both the barrels with buck shots. I also clipped the torch to it and got ready for any eventuality. I sat and sat like this, for what seemed hours, but nothing happened, except that I started getting cramps in my legs and sharp needle points moved up and down over them. I stretched them as far as possible and let them hang loose for a little while. That gave me some relief.

Nothing happened for another two and half hours and I began to feel apprehensive. A strange suffocating eerie stillness descended on the area. Then I had the first indication of a larger carnivore on the move. The peacocks gave their alarm signal and a group of langurs started chattering loudly and excitedly, giving out their alarm call of "whoop ! whoop !" This meant that the larger carnivore, most probably a leopard, was about. I got ready. The remains of the boy looked very indistinct and hazy but I knew the general direction and so concentrated all my attention there. The gun was aligned and the safety catch was pushed forward. For a long time nothing happened and then I saw or rather felt, some movement near the body of Ramu. The movement or noise was hardly perceptible or audible but because of my trained eyes and ears, I knew it was there. I put my finger on the trigger and switched the torch on, ready to fire. As the beam of light pierced the darkness, I saw a pair of hyenas vigorously tugging at the body. Being caught in the light, they quickly disappeared into the palm grove. The appearance of hyenas on the kill meant only one thing that the real killer was nowhere near. This invasion of hyenas took place a couple of times and I scared them every time they came. But soon I got bored of it.

In this preoccupied state of mind I had forgotten to notice any other development. For instance the suffocating, intense heat and the stillness of the air. Concentrating my attention on the hyenas, I was oblivious of my surroundings. Suddenly I felt a waft of cool breeze caressing my cheeks and then literal hell broke loose. The dust storm which had been brewing and I had failed to notice, bursted and a gale of about hundred kilometres an hour hit me with a velocity of an hurricane and the dust of the entire world, filled my eyes, nostrils, mouth and all the pores of my body, almost choking and suffocating. So tremendous are the dust storms of Rajasthan. The branch, I was sitting on started swaying dangerously, so much so that it almost touched the nalah bed at its lowest point. The notorious Andhi, as it is locally called, was on in all its fury.

The biggest and most immediate problem, for me at that time was, to keep a hold on my perch and not to fall down, as it shook violently. I hung on precariously for some time like this and the dust storm turned more and more wild. Then suddenly and swiftly, I felt a chill running down my spine, warning me that I was in mortal danger.

My sixth sense, which had come to my rescue many times before, was telling me that the man-eater was around and about to strike. The only direction that I expected the attack to come from, was from the road. So I turned about and switched my torch on, with the gun ready. At that critical moment, the wretched torch failed and the beam of light, which I was expecting did not come. Cold sweat oozed out all over my body and I got, into real panic. But at such fatal moments, the instinct of survival and preservation always comes to your rescue. It did in my case and saved me from a certain and horrible death. Without thinking, I just jumped into the nalah bed. It was sandy and therefore I escaped fractures and broken bones. But there was no time to think about them. Every moment was precious, as all the time I was expecting the fatal leap from the leopard. There was a bend in the road about hundred yards from the Bir tree, which I had noticed while parking the car. I ran for it as fast as my legs could carry. It was the fastest hundred yards I had ever ran. Made it. Climbed the road and then again ran fast towards the car. On reaching the car, luckily, I did not find difficulty in getting the keys out from my pocket, which was quite possible. I quickly unlocked the door and got in the car and again locked it from inside. All this while I knew that the deadly leopard was close on my heels. My whole body was shaking with fear and the visibility was nil. Once inside, in the security of the car, I took a sigh of relief but knew that the danger had not passed and that the man-eater was still lurking nearby. So when I had sufficiently recovered and got back my bearings, I unhitched the torch from the gun and turning towards the rear, switched it on. Surprisingly the light came. Perhaps the violent shaking that the torch had in my run, reset the combination. The beam of light caught two ember lights and I could also make out a small animal sitting on the road, a few yards from the car. So the only thing that I could do to scare the animal away was to toot the horn of the car furiously. This I did and kept on vigorously. Hearing the noise, the leopard smoothly glided into the nalah. This was the closest shave I have had in my entire life as a big game hunter and was I scared or was I?

The dust storm lasted for another hour and then stopped as abruptly as it had come. Superfine dust settled down everywhere. It was 3.30 A.M. when I got out of the car and went back towards Ramu's body. There were indication of an early dawn already in the east. Reaching the body, I discovered, to my sorrow, that the wily beast had had a leisurely meal. I felt very sad because I had promised the parents that I would not allow any harm coming to the body. To tell them the harrowing experience, I had gone through during the night, and the fact that I had escaped by the skin of my teeth, in providing a meal of white meat to the leopard, would be of no use, I knew. It would not be acceptable to them.

When it became light, the faithful girdhawar and the patwari turned up. I told them what had happened. They advised me to go home as they would be able to handle the parents of Ramu. But I insisted on staying back and meeting them, though I was feeling

very tired and would have loved to have had a little rest in my bed. But if I had gone away then it would have meant running away from an awkward situation and making my subordinates face the music. This was not fair. A little later the villagers came, along with the parents of Ramu. I tried to explain to them the happening of the night but they were not convinced and were very unhappy and disappointed. I felt very sad but eventually managed to pacify them by giving them Rs. 100/-.

After this unhappy episode, where the hunter nearly became the hunted, a wild scare spread throughout the countryside and the prowess of the animal became legendary. Its notoriety assumed astronomical proportions and people started shivering at the very name of it. A famous shikari, who was a hakim by profession in Ajmer, tried his hand to get at the animal but missed it from a very close range. Its stature soared to further heights. Then it all ended in a tame exit of the dreaded beast at the hand of a village woman.

Ghasi was a Gujar woman, tall, young, strong, healthy and active as women of these parts are. She had a robust constitution, sharp feature and was very hard working, fearless and brave. December was wearing off when one day, like any other day, she took food for her husband in the field. He ate the frugal meal and topped it up with a lot of lassi. After that rested on the ground and closing his eyes dozed off. Ghasi left him like that. She had brought with her a sharp edged axe to cut some dry wood on the way and take it home for fire. She had hardly gone fifty yards when she heard her husband's shrieks. She rushed back and saw him grappling with a leopard and getting the worst of it. She swung a mighty blow at the animal with her axe and caught it at the nape of its neck. It rolled over and collapsed. She gave it few more blows, just to make sure. But it did not move. That was the end and the spotted terror a small mangy female of the species, thus met its ignoble end.

आकर्षक एवं सुन्दर राष्ट्रीय पक्षी मोर

लेखक—वीरेन्द्र सहाय सक्सेना, भारतीय वन सेवा, उप वन संरक्षक, जयपुर

हमारे प्राचीन ग्रन्थों में वर्णन आता है:—

केका कर्णामृतं ते सकुसुमकबरी कान्तिहाराः कलापाः
कंठच्छाया पुरारेर्गलरुचिरचिरा सौहृद्यं मेघसर्पैः
विश्वद्वेषिद्विजिह्वस्फुरदुरुपिशितैर्नित्यमाहार वृतिः
कैः पुण्यैः प्राप्तमेतत्सकेलमपि सखे चित्रवृतं मयूर ।

तेरी कूक कानों को अमृत समान लगती है । कामिनी के जूड़ा पाश में लगे हुए सुन्दर पुष्प जाल की कान्ति उपहरण करने वाली तो तेरी पूँछ है । महादेव के कंठ के समान तेरी नीलिमा है, मेघों के साथ तेरी मैत्री है । सर्प, जिसका संसार मात्र से विद्वेष है तेरे नित्य के आहार हैं । मित्र मयूर ! बता तो सही, किस पुण्य से तूने इन्हें प्राप्त किया ।

जिस मोर के पंख को स्वयं भगवान् श्री कृष्ण सर पर धारण करे, वह अमरता क्यों न पाये ?

राष्ट्रीय पक्षी का चयन

सन् १९६० में जापान की राजधानी तोक्यो में अन्तराष्ट्रीय पक्षी रक्षण परिषद का सम्मेलन हुआ था जिसने यह सिफारिश की थी कि प्रत्येक राष्ट्र अपना राष्ट्रीय पक्षी चुने । भारत ने यह गौरव मोर को दिया । अमेरिका ने उकाब, कनाडा ने कनाडी कल हंस, ग्वाटेमाला ने दूधराज, जर्मनी ने सफेद लगलग को राष्ट्रीय पक्षी चुना तो जापान ने हरी पिद्दी, श्री लंका ने बनकूकड़, बर्मा ने बर्मी मोर, दक्षिणी अफ्रीका ने नील सारस, नेटाल ने शुतरमुगं तथा ब्रिटेन ने दोयल को यह मान दिया है । अन्य राष्ट्रों ने भी अपने-अपने राष्ट्रीय पक्षी चुने हैं यथा हवाई द्वीप ने हवाई हंस, डेनमार्क ने चंडूल, कोलम्बिया ने करगस, जाउज़िया ने अबाबील, उत्तर आयरलैंड ने शखिनी आदि आदि ।

अनेक नाम

मोर के अनेक पर्यायवाची नाम हैं जैसे मयूर, मंजूर, केकी, शिखेडी, सारंग, अहिभक्षी, नीलकण्ठ आदि । भारत की प्रादेशिक भाषाओं में भी इसके विविध नाम हैं । संस्कृत में शिखी, हिन्दी, गुजराती, मराठी में मोर, कन्नड में नविलु, तमिल में मइल, तेलगु में नेमलि, मलयालम में मैल, बंगला में मयूर । अंग्रेजी में इसे 'पीकाक' कहते हैं तो इसका अन्तराष्ट्रीय वैज्ञानिक नाम है 'पेवो क्रिसटेटस' ।

विदेशों में भी मोर

मोर विशेषतः भारत में ही मिलता है । भारतीय मोर में श्वेत मयूर काले-सफेद मोर तथा कन्धों पर काले पंख वाली जाति उत्पन्न की जा चुकी है ।

एक अन्य मोर, हरा मोर, 'पेवो म्यूटीकस', वर्मा, श्याम, इण्डोचीन, मलाया, जावा में पाया जाता है। ये हरा व सुनहरा ज्यादा होता है तथा इसकी कलंगी नुकीली होती है। ये हरा मोर आसाम में भी मिलता है। अफ्रीका में कांगों मोर 'अफ्रोपेवो कगिनसिस' सन् १९३६ में देखा गया, ये शर्मीला होने के कारण सुदूर तथा घने वनों में ही मिलता है। ये हरा, नीला तथा छोटी पूंछ वाला होता है। इसकी दूहरी कलंगी जो काली व सफेद होती है इसके रूप में अनुपमता ले आती है। दक्षिणी पूर्वी एशिया में मोर से मिलते जुलते 'पीकाक फेजेन्टस' मिलते हैं पर ये वास्तव में मोर नहीं होते।

लोक धर्म में मोर

लोक मानस में जो मोर के प्रति भाव माधुरी है उसने इस विश्वास का रूप लिया है कि मयूर दर्शन व केक श्रवण मंगलकारी है। वासक गृहों की भित्ति पर, नगर द्वारों पर, सजावट के रूप में मयूर चित्र का अकन एक लोक विधान सा है। विवाह पर तो मोर के चित्र आज भी इस किंवदन्ति को समर्थन देते हैं कि इससे वरवधू मोर की भाँति नृत्यरत रहेंगे। राधाकृष्ण लीला सम्बन्धित प्रसंगों में मयूर चित्रण काफी प्रचलित है। मोर का सन्मुख ही दाहिनी ओर से बोलना अच्छा शुकुन माना जाता है घन प्राप्तिहेतु। आज भी आदिवासी क्षेत्रों में मोर, तोते का गुदना गुदवाने का रिवाज है।

बृहमवर्चत पुराण के अनुसार विद्या देवी सरस्वती को मोर के कण्ठ से पैदा हुआ बताया गया है। गणेश के ज्येष्ठ भ्राता कार्तिकेय अथवा सुब्रह्मयामन्यम का वाहन मोर ही है तथा उनका ध्वज चिन्ह भी मोर ही है। यूरोपीय भाषाओं में मोर का एक नाम 'यूनो का पक्षी' है। यूनो देव सामाजी है और पूर्ण सौंदर्य की देवी भी। हमारे यहाँ भी मोर के रूप श्री को योग्य मान दिया गया है, हमने मोर पंख को अपने सिर आंखों ही नहीं लगाया देवताओं के शीर्षों पर स्थान दिया है।

हमारे नृपगण भी मोरपंख से सुशोभित मुकुट धारण करते रहे हैं। पुष्टिमांग से मोरछल हिलाना सेवा भाव का प्रतीक माना जाता है। मुगलों के काल में 'तख्ते ताऊस' में मोर ही प्रतिबिम्बित था, यही सात वर्षों में निर्मित, मयूर सिंहासन, न्याय का आसन था। उदयपुर के शीश महल में रत्न जड़ित मोर का चित्र जगद् विख्यात है।

साहित्य में मोर

भारतीय भक्ति साहित्य में तो जो स्थान मोर को मिला है संभवतया वह किसी अन्य को नहीं मिला। दरद-दिवानी मीरा का तो घोष ही है।

'जाके सिर मोर मुकुट मेरो पति सोई, दूसरों न कोई'।

श्रीधर पाठक ने मेघागमन को यों देखा:—

'यह मोर नचावत शोर मचावत

खेत खेत वगपाति उठावत

सुख पावत आवत मेघ महावत'।

मैथिलीशरण गुप्त की आश्रम कन्या भी तो:—

तोते कभी पढ़ाती थी
कभी मयूर नचाती थी
सहचरियों के साथ
छाँह में क्रीड़ा कभी मचाती थी ।

कालीदास का यक्ष मेघदूत को निर्देश देता है कि 'गरज गुञ्जा कर कुमार के मोर को नचाना' भारत में तो मयूर नर्तन के बिना, वर्षा की कल्पना ही नहीं की जाती:—

‘मोर बिनु पावस, कोकिल बिन नहीं मधुमास’ ।

वर्षा में सुमित्रानन्दन पंत भी मोर की म्याऊ म्याऊ से मुग्ध हो लिखते हैं:—

‘दादुर टर टर करते फिल्ली बजती झन झन,
म्याऊ म्याऊ रे मोर, पीऊ पीऊ चातक के गरा’ ।

सुभद्रा कुमारी चौहान को मयूरी का भी नृत्य शिक्षाप्रद लगता है:—

‘अरी मयूरी नर्तन तेरा मोहित करता है घन को
मुझे सिखादे कला, मोह लूँ मैं अपने मन के घन को’ ।

बच्चन जी भी आत्म विभोर हो कहते हैं:—

‘मयूरी नाच मगन मन नाच
गगन में सावन घन छाये
न क्यों, सुधि साजन की आये
मयूरी आंगन आंगन नाच
मयूरी नाच

श्यामनारायण पांडेय हल्दी घाटी के रण रंग प्रसंग की पहली ही कड़ी में मोर थिरकाते हैं:—

‘सावन का हरित प्रभात रहा अम्बर पर थी घनघोर घटा,
फहरा कर पंख थिरकते थे मन हरते थे वन मोर छटा’ ।

नीरज की उग्र चिंता है:—

‘मैं सोच कर रहा हूँ
अगर तीसरा युद्ध छिड़ा
यह शोर मोर का
भ्रमर की यह गुनगुन
यह जोत जुगनुओं की

यह भीगुर की झुन झुन
क्या इन सब पर
खामोशी मौत बिछा देगी' ।

गरज यह है कि इस देश के काव्य कानन में क्रीड़ा करने वाले कवियों ने किसी न किसी प्रसंग में मोर की अवश्य चर्चा की है। इसका मुख्य कारण इसके गुण ही हैं विशेष रूप से सौंदर्य ।

सौंदर्य का प्रतीक

पक्षियों में मोर अवश्य ही अत्यन्त सुन्दर है। लगता है इसके सभी अंगों को किसी चतुर चितरे ने बड़ी कुशलता पूर्वक अंकित किया हो। मोर को इस देश में कौन नहीं पहिचानता, लम्बी चित्रित पूंछ, जो नाचते वक्त गोल फलक सी हो उठती है तथा जिसमें पुखराज, नीलम, फोरोजा की मानों हजारों आँखें जगमगाने लगती हैं, सर पर मदमस्त झूलती हुई कलंगी, नीली मखमली लम्बी ग्रीवा, असंख्य रंग लिये पंख, किसका मन नहीं मोह लेते। वर्षा में जब आकाश मेघाच्छन्न हो जाता है तो मोर बेहाल हो जाता है; वह आत्ममुग्ध हो जाता है, बारम्बार नाचता है, कूकता है, समा बाँध देता है। नाचता है, नाचता ही जाता है और मोरनियां उसके इर्द गिर्द आकर चक्कर लगाने लगती हैं। नाचता मोर ऐसा शोभायमान होता है जैसे गोपियों के बीच कृष्ण कन्हैया। मयूर का अंग अंग, सर से लेकर दुम तक, बड़े कलात्मक रूप से सृजित किया गया है किन्तु उसके पैर अपेक्षाकृत भद्दे हैं तभी कहते हैं कि मोर नृत्यविरत तब होता है जब उसकी दृष्टि टांगों पर पड़ती है।

नर ही मव्य

मोर में भी अधिकांश पशु पक्षी जगत की नाई नर ही अधिक सुन्दर, पराक्रमी व चतुर होता है। मोर गिद्ध के आकार का होता है किन्तु नर में लगभग एक मीटर लम्बी चमकीली, नीली, हरी, सुनहरी पूंछ होती है। मादा में यह पूंछ नहीं होती है साथ ही वह मटमैले भूरे रंग की कान्ति विहीन सी होती है। गर्दन के निचले भाग में जरूर कुछ चमकदार हरापन होता है। मादा में भी नर की तरह किरीट होता तो है पर वह भी छोटा होता है। नर के पैरों में दो नुकीले कांटे से होते हैं जो युद्ध द्वन्द्व में प्रयोग में आते हैं। रंग रूप में मोरनी मोर के सामने ऐसी ही है जैसे हिरनियों के बीच काला मृग।

भारत में मोर

मोर सारे भारत में ही मिलता है। बृज भूमि एवं चित्रकूट में तो यह भारी संख्या में मिलते हैं दक्षिणी भारत में इनकी संख्या अवश्य कम है। यह ज्यादातर नदी व नाले के किनारे वाले क्षेत्र ही पसंद करते हैं। हिमालय में भी ५००० फीट से ऊपर ये नहीं मिलते। उन पहाड़ों पर, जहाँ सर्दी अधिक पड़ती हो, ये दूर भागते हैं। इनका निवास झाड़ीदार व प्रतिवर्ष पतझड़ करने वाले वनों में ही अधिक है। सूर्योदय के साथ साथ ये आहार प्राप्ति को अपने अपने रैन बसेरे से उड़ पड़ते हैं। रैन बसेरा ये ऊँचे वृक्षों पर ही करते हैं। अपराह्न में भी यह भोजन जिसमें अनाज, शाक सब्जी, पत्ती, कीट पतंग व छिपकली शामिल हैं, करता है। सर्प भक्षण इसको प्रिय है। इसी से जहाँ मोर होते हैं साँप नहीं दिखते हैं। कहा भी है 'अहि कराल केकी भकै, मधुर अलापनि हारि'।

मोर साधारणतया टांगों से ही चलना पसन्द करता है और शक्ति होने पर यह शीघ्रता से घनी झाड़ियों में लुकछिपकर भाग निकलता है। अचानक भयातुर होने पर यह उड़कर भी अपनी रक्षा करता है। नदी नाले व गहरी चौड़ी कन्दराओं को यह उड़कर ही पार करता है। इसकी एक उड़ान ५०० फीट से भी ज्यादा हो सकती है।

मानव से साहचर्य

मोर का 'मैं आव मैं आव' बोलना विशेषतः वर्षा में बड़ा मनोहरी होता है। कूकते समय इसकी ग्रीवा में कम्पन स्पष्ट दीखता है। मोरनी तो बहुत ही कम बोलती है। कभी कभी बोलती भी है तो फटे बांस की तरह। मोरनी कभी कभी नाचती भी है। मोर, कपोतों की तरह, काफी जल्दी हिल जाता है, दो चार बार दाना चुगाया नहीं कि ये रोज आने लगेंगे और निर्भय हो हथेली से भी दाना उठाकर खाने लगते हैं। यह मानव-पक्षी प्रेम का परिचायक है। भारत में मोर का लगभग २००० वर्षों से पालतु होने का प्रमाण मिलता है। भारतीय मोर ११ वीं सदी में इराक आदि देशों में भी ले जाये गये किन्तु इनमें भारतीय मोरों के रूप सा निखार नहीं आ सका। बाइबिल के 'ओल्ड टेस्टामेंट' में लिखा है कि 'बादशाह सुलेमान के शासन काल में प्रति तीसरे वर्ष पूर्व के जहाज पश्चिम में सोना, चाँदी, हाथी दाँत, बन्दर तथा मोर ले जाते थे। सिकन्दर भी लौटते समय यूरोप में भारतीय मोर ले गया था और इसी से वहाँ इनके वंश की वृद्धि हुई।

रंगीली तबीयत वाला मोर

मोर एक पत्नी में विश्वास नहीं करता। इसके रंग महल में बहुधा चार अथवा पाँच मयूरी देखी गई हैं। मयूरी का मन मोहने के लिये यह आकर्षक पंखों की वेश भूषा धारण करता है। साधारणतया मोरों का प्रणय काल जनवरी से अक्टूबर तक होता है किन्तु अधिकांश में यह होली व दीपावली के बीच ही होता है। होली के आस पास में इसमें चमकीली पूँछ बढ़ने लगनी है तथा निदाघ में यह घनी होकर, वर्षा पूर्व पराकाष्ठा पर पहुँच जाती है। उमड़ते बादलों के साथ इसका थिरकता हुआ नृत्य अत्यन्त ही हृदय गामी होता है। नर्तन में अग्रभाग तो सुन्दर छटा युक्त तो होता ही है, पृष्ठ भाग में कत्थई पंख भी लहरमय हो इसके शरीर में स्पंदन उत्पन्न करते हैं। मोरनी, मोर के अश्रुपात से गर्भ धारण करती है, यह युक्ति एकदम कपोल कल्पित है। यह कहना संभव नहीं है कि मोर प्रति वर्ष उन्हीं मोरनियों के साथ रमण करता अथवा अपनी प्रियतमाओं को बदलता रहता है। सर्दी के शुरू होने पर पूँछ से पंख गिरने लगते हैं और वृज में तो ये दीवाली के एक दिन बाद आने वाले गोवर्धन नूजा के लिये काफी मिल जाते हैं।

नीड़ निर्माण व शिशुपालन

गर्भ धारण के उपरान्त मयूरी नीड़ निर्माण में व्यस्त हो जाती है, नर अपनी प्रियतमा का गृह निर्माण व शिशु पालन में कोई हाथ नहीं बंटाता। मयूरी जुलाई में घनी झाड़ियों के बीच हल्की सी जमीन खोद कर, एक गड्ढा बनाती है। उसमें पतली १-१½ फीट लम्बी लकड़ियों से २-३ फीट लम्बा घोंसला बनाकर पत्तियों का नरम नरम सा गद्दा बनाती है जिसमें बैठकर यह अण्डे सेह सके, तथा बच्चों की रक्षा कर सके। कभी कभी तो ये किसी खण्डहर या ऊँचे मकान की छत पर भी अण्डे दे देती है। एक मोरनी ने तो, एक वर्ष भरतपुर पक्षी बिहार में,

कदम्ब के वृक्ष पर स्थित गत वर्ष के गिद्ध के घोंसले में ही अंडे दे दिये थे। अंडे बहुधा ३ से ५ तक होते हैं पर ६ तक भी होते हैं। ये सफेद में कुछ पीलाई लिए हुए चिकने होते हैं तथा आकार में देशी मुर्गे से लगभग तीन गुने, साधारणतया ये ७० से ८० मी० लम्बे होते हैं और ५० से ६० मी० मोटे। ४ सप्ताह में अण्डों से एक एक कर बच्चे निकलने लगते हैं। बच्चों के सिर पर कलंगी निकलना है इतना ही कष्टप्रद है जितना मानव शिशुओं में दांत निकलना। मोरनी का अपने बच्चों के प्रति अगाध प्रेम होता है। मातृमयूरी दक्ष शिक्षक है। दिल्ली के लोदी गार्डन में ६ अक्टूबर की शाम को मे० ज० हटसन ने देखा कि एक मोरनी सूर्यास्त होने पर बड़े बबूल पर बैठी आकुल सी है। मोरनी ने एक 'ईहा' की आवाज की और एक बच्चा, तीतर के आकार का, ऊपर पेड़ पर आया, बच्चा मोरनी के पास पहुँच कर थोड़ी देर को उसकी पीठ पर बैठ गया। मोरनी कुछ ऊपर को डाल पर चढ़ी और बच्चा भी। पर मोरनी अभी व्याकुल थी। उसने एक और जोर की आवाज निकाली, दूसरा बच्चा झाड़ियों से उड़कर पेड़ पर पहुँचने से पूर्व ही घरातल पर गिर गया। मोरनी फुर्ती से उड़ कर नीचे आई, साथ ही पहला बच्चा भी। मोरनी ने प्रयास, प्रोत्साहन व मार्ग दर्शन के उपरान्त दोनों बच्चों को पहले एक छोटे पेड़ पर ले लिया और फिर दोनों बच्चे सहित बड़े पेड़ पर पहुँच गई और लगभग ४० फीट ऊँचे इस पेड़ पर अपने दोनों डैनों के नीचे एक एक बच्चा लेकर उसने रैन बसेरा किया। दूसरी रात उसने यह पेड़ नहीं चुना रात्रि विश्राम को। एक वर्ष में शिशु अपनी माँ से पृथक् हो अपना स्वतन्त्र जीवनयापन करने लगते हैं।

उपयोगिता

मोर बड़ा उपयोगी पक्षी है जहाँ इसका दर्शन, नर्तन हमको हर्षित करता है हमें मानसिक व्याधाओं से बचाता है। वहाँ ये हमारे विषैले सर्पों को भी खाकर जीवन दान देता है। यह हानिकारक कीट पतंगों को खाकर हमारी फसलों की भी रक्षा करता है। पर यह हमारे बाग बगीचों के बढ़ते हुए पल्लवों को खाकर भी नुकसान करता है। आज भी देहातों में इसकी बीट को बांध कर फोड़े फुन्सी पकाये जाते हैं। यह विश्वास किया जाता है कि इसके अण्डे की धूनी से बच्चे रोगमुक्त हो जाते हैं। इसके पंखों के गंडे बनाकर जले अथवा सर्प दंक्षित स्थान पर लगाये जाते हैं। मोर पंख की अनेक सुन्दर आकर्षक वस्तुयें बनाई जाती हैं। इसके पंखों के निर्यात से विदेशी मुद्रा का अर्जन होता है। भारत में इसका मारना कानूनन मना है किन्तु कहते हैं इसका माँस बड़ा स्वादिष्ट होता है। मध्य युगीन यूरोप के देशों में तो यदि मोर का माँस दावत में न हो तो वह फीकी मानी जाती थी। कितना हास्यापद है मानव आहार का यह रूप जिसने इतने कलापूर्ण पक्षी को भी नहीं छोड़ा।

यह हमारा सौभाग्य है कि इतना आकर्षक, सुन्दर, उपयोगी तथा मानव मात्र से साहचर्य में विश्वास रखने वाला पक्षी मोर हमारे देश का राष्ट्रीय पक्षी है। इस वन्य प्राणी सप्ताह में आइये हम भी प्रण करें कि मोर तथा इसके जैसे अनेक मूक वन्य प्राणियों की हम न केवल दुष्ट शिकारियों व व्यापारियों के क्रूर हाथों से रक्षा करेंगे अपितु इनकी निरन्तर वृद्धि हेतु अपना सक्रिय योगदान दें तथा भारत के गर्व को उन्नत करेंगे।

संदर्भ

१. अली सालिम डा० (१९६४) 'दी बुक आफ इन्डियन बर्ड्स' बॉम्बे नेचुरल हिस्ट्री सोसायटी, बम्बई, १९६४.
२. अली सालिम डा० (१९६६) 'बर्ड्स आफ केराला' ऑक्सफोर्ड यूनिवर्सिटी प्रेस मद्रास, १९६६.

३. जिमर हैनेरिक (१९६२) 'मिथ्स एण्ड सिम्बल्स इन इन्डियन आर्ट एण्ड सिविलाईजेशन' हारपर टोर्च बुक्स, बोलिन जैन लाईब्रेरी, न्यूयॉर्क ।
४. थोम्पसन ए० लेन्डस बोरोह, सर (१९६६) 'ए न्यू डिक्शनरी आफ वर्ड्स' ऐ सेन्टेनरी पब्लिकेशन आफ ब्रिटेन आरनोथोलिज्स्ट यूनीयन लन्दन ।
५. नवलपुरी युगजीत (१९७०) "राष्ट्रपक्षी मोर कवियों की दृष्टि में", साप्ताहिक हिन्दुस्तान दिल्ली ।
६. सक्सेना बी०एस० (१९६२) "पशु-पक्षी धर्म और इतिहास" दैनिक राष्ट्रदूत ६ अक्टूबर १९६२ जयपुर ।
७. सक्सेना बी०एस० (१९६६) ,पीफाउल लेज एस इन बलचरस नेस्ट' न्यूज लैटरफोर बडवाचरस, बम्बई अक्टूबर १९६६ ।
८. सिंह राजेश्वर प्रसाद नारायण (१९५८) 'भारत के पक्षी' पब्लीकेशन्स डिवोजन सूचना और प्रसारण मंत्रालय दिल्ली ।



Welcome to:

JALDAPARA WILD LIFE SANCTUARY

Best time to visit—NOVEMBER TO APRIL

Situation—Alipur, Jalpaiguri District, West Bengal.

Scenic Beauty—River Torsa with nine Tributaries flows through the riverine forest of the sanctuary.

Wild Life Attraction—See the world famous Indian one-horned Rhinoceros in natural habitat and also Elephants, Royal Bengal Tigers, Panthers, Bison, Sambhar, Cheetal and India's National Bird—the Peacock and a variety of Bird Life.

Area—Thirtysix sq. miles near Bhutan border.

Railway Station—Hashimara—only two km. from Tourist Bungalow, Barodabri.

Air Strip—Hashimara, Bi-Weekly Air Service from Culcutta. Motor from Cooch Behar or Bagdogra on Air Service from Calcutta.

Forest Department Jeep and Elephants available to tourists on hire,

Accommodation—Modern Tourist Bungalow with catering arrangements at reasonable charges of Rs. 15/- per day per person inclusive of Lodging, Bed Tea, Breakfast, Lunch, Afternoon Tea, and Dinner.

*Information and Reservation from:—***THE DIVISIONAL FOREST OFFICER,
Cooch Behar Division, P.O. Cooch Behar (W.Bengal)**

Telephone: **Cooch Behar 27.**

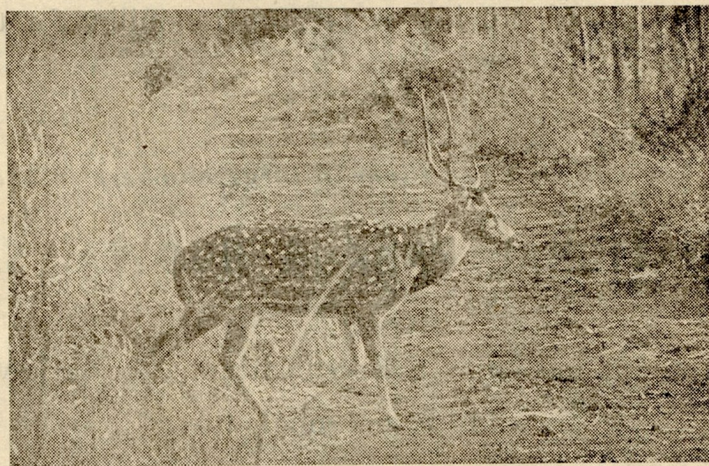
A tree is known by the fruits it bears;

A forest is known by the animals it rears.

Come and see it for yourself

Visit:

PALAMAU NATIONAL PARK
&
HAZARIBAGH NATIONAL PARK
IN
BIHAR



For details please contact: —

1. **Divisional Forest Officer,**
Daltonganj South Division,
At & P.O. Daltonganj,
Dist. Palamau (Bihar).

2. **Divisional Forest Officer,**
Hazaribagh West Division,
At & P.O. Hazaribagh,
(Bihar).

*New Game Laws need a change
in the
Nation's Outlook.*

*The wild life is not abundant to-day, and needs strict protection.
Help us in checking illicit shooting and netting etc.*

We have to conserve the natural forests—the home of wild life;
the water resources and provide peace and tranquility for their growth
and healthy living.

You can still see them in large numbers in the

CORBETT NATIONAL PARK & DUDWA SANCTUARY

Pay a visit and enjoy the scenic beauty, the variety of
wild life and jungle life.

**Chief Wild Life Warden,
Uttar Pradesh,
LUCKNOW.**

DEHRA DUN

Patron-in-Chief:—His Excellency Shri V.V.

Giri, President of India.

President:— Maharaja Pratap Singh

Malvendra of Nabha.

Executive Vice-President:—Shri T.S. Negi.

Hony. Secretary & Treasurer:—Dr. R.N. Misra

Hony. Asstt. Secretaries:—

1. Dr. S.K. Sangal.
2. Shri S.K. Sinha.
3. Shri N.K. Gaur.

Delhi Branch

President:—Maharaja Pratap Keshari
Singh Deo of Kalahandi.

Hony. Secretary:—Commander K.N. Bahl

Assam Branch (Shillong)

President:— Maharaja of Charkhari

Hony. Secretary:—Mr. M.A. Islam, I.F.S.

Bihar Branch (Monghyr)

President:—Kumar Surindra Singh.

Hony. Secretary:— Prof. A.A. Khan.

Editorial Board

1. Dr. R.N. Misra. 2. Shri R.D. Singh. 3. Dr. S.K. Sangal. 4. Shri S.R. Chaudhury.
5. Shri K.C. Sahni. 6. N.K. Shri Jain.

**Buy from the Hony. Secretary, Wild Life Preservation Society of India
7, Astley Hall, Dehra Dun.**

	Price
(1) Society's Tie (with Cheetal head in gold on green silk)	... 12.00 each
(2) Society's Writing Pads and Covers (Set of 2 pads with 100 envelopes)	... 25.00 „
(3) Balance of Nature Game (for Members)	... 6.00 „
(4) 'National Parks' by K.S. Sankhala, I.F.S. (Published by W.L.P.S.I.)	
	(Post free) ... 9.00 „
(5) Singh Parivar in Hindi by M.D. Chaturvedi	... 3.00 „
(6) Panther on the Prowl by M.D. Chaturvedi	... 3.25 „
(7) CHEETAL—I.U.C.N. Special Sovenir Issue, 1969	... 5.00 „
(8) „ „ „ „ „ 1972	... 4.00 „
(9) Greeting Cards 1973	... 1.00 „

Tourism is the world's biggest industry...

... and the fastest growing !

Tourism is a Rs. 11,000 crore world business today. Roughly twice the size of the oil industry. In five years, it will be worth Rs. 18,000 crores ! An almost 75% increase.

Investment in tourism earns the most foreign exchange in the shortest time. For instance, Yugoslavia invested Rs. 38.3 crores in tourism in 1968 and earned Rs. 140.3 crores. A net profit of 250% ! And Spain could build two steel plants like Bhilai each year on her tourism earnings alone !

What about India ?

The number of visitors to India has increased. From 150,000 in 1964 to almost 245,000 in 1969. And our earnings from tourism have gone up to Rs. 33 crores in foreign exchange. But in terms of world tourism, India got only one out of every thousand world travellers last year. Yet we have just about everything to make India the world's most attractive tourist destination.

What's missing here ?

Nothing but broad-based public participation. And enough of what is known as the 'infrastructure' : hotel accommodation, transport facilities and tourist amenities. For instance, the city of Bangkok alone has more hotel beds suitable for tourists than the whole of India !

And when the Jumbo jets come, bringing many thousand more visitors our way, we shall need all these amenities in far greater measure.

What are we doing about it ?

The Government is actively involved in the building of new hotels, improving air and transport services, providing new and better tourist facilities.

But that is not enough. Because Tourism is everybody's business. It involves people at every level all over the country. So join us in our efforts. Let us give the tourist the amenities he needs and see that he goes home happy. Each happy tourist means so many more will come next year. Shouldn't be too difficult for us. Isn't ours one of the world's oldest traditions in hospitality ?



Department of Tourism
Government of India